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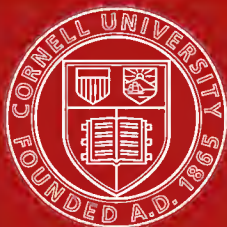
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MADAGASCAR, MAURITIUS

AND

THE OTHER EAST-AFRICAN ISLANDS

BY

PROFESSOR DR. C. KELLER

With 3 Coloured Maps and 64 Illustrations



LONDON:
SWAN SONNENSCHN & Co., LIM.
PATERNOSTER SQUARE.

1901.

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TRANSLATED BY

H. A. NESBITT, M.A.

P R E F A C E

The task of describing the East-African Island-World must be regarded as a grateful one in itself, for everything unites in lending an exalted charm to the subject. In these islands Tropical Nature displays her magic in all its fulness, and their history is replete with remarkable incidents. If I were master of the power of expression of a Bernardin de St. Pierre, whose descriptions of the scenes of nature are unsurpassed, I would make the attempt to give an adequate picture of the mighty Tropical Nature—but I feel that I must confine myself to a pale and realistic sketch of that lovely island-world, and I thus stand in need of indulgence.

It is now twelve years since I visited the Seychelles, the Mascarenes and Mauritius, regions which had been till then but little visited. Events have since that time brought the East African Archipelago, especially Madagascar, into the foreground of European interest. As during my journey I had devoted myself almost exclusively to working out special questions of Natural Science, I have been under the necessity of discussing matters foreign to my pursuits.

Fortunately, earlier workers in the same field are not wanting. The Mascarenes, for example, have been described again and again. Alfred Grandidier, of Paris, has devoted his whole life to the exploration of the colossal island of Madagascar, and his magnificent work forms a rich mine of information.

I am personally greatly indebted to this eminent French geographer for having furnished me with effective recommendations to the French authorities in Madagascar and thus eminently facilitating my studies. I am also indebted to him for sending me his portrait, which

is inserted in this volume in homage to the great services he has rendered to the investigation of Madagascar.

While the manuscript was in the press, there appeared the valuable contributions by the German traveller Dr. Völtzkow on the hitherto imperfectly known islands of Juan de Nova and Aldabra.

It has been considered desirable that the islands lying in the west of the Indian Ocean towards Australia should also be incorporated in this work. I have not visited these islands, but we possess sufficient information about them from recent German, French, and English expeditions, and of this I have made use.

The illustrations are partly from photographs taken by myself. A number of the pictures of Madagascar, many of which have indeed been published in another form, were borrowed by me from the "*Revue générale des Sciences*", which not long ago published as a special number an excellent paper entitled "*Ce qu'il faut connaître de Madagascar*". The pictures of the Seychelles are new, and for them I am indebted to the great kindness of Dr. A. Brauer, who took very successful photographs on the spot and forwarded plates to me to make use of.

Other illustrations, admirably executed by Dr. Völtzkow, have also been turned to account.

C. KELLER.

TRANSLATOR'S PREFACE

There is no book in existence which presents so complete and trustworthy an account of Madagascar, the Mascarenes and the smaller islands of the Ocean to the East and South East of Africa as this work of Professor Keller. To the scientific thoroughness and accuracy of the German professor he adds the vividness and realism due to personal travel and investigation. His theories of the ethnological history of Madagascar appear to me to be unanswerable, although they differ from those of most writers on the subject, and even in some respect from those of Grandidier, with whom, however, he is generally in accord.

The geologist, the botanist, the zoologist, the meteorologist, the ethnologist, and the historian will all find new and interesting matter in the book, treated in an eminently rational and scientific tone, and embellished with skilfully selected illustrations.

H. A. NESBITT.

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INTRODUCTION

ALTHOUGH the island world which is ranged before the mainland of Africa in the Western part of the Indian Ocean is far and away less imposing in extent than the Archipelago in the North East of this oceanic region, yet it is probably not in any way inferior in the individuality of its characteristics.

Man and Nature here combine to form a world of itself, which, while markedly deviating from the continental character, exhibits a singular mixture of the peculiarities of African and Asiatic life, and this fundamental characteristic recalls, so to speak, the geological history of the East African islands. Certain points in the distribution of animals led long ago to the supposition of an ancient connexion both with Southern Africa and Southern Asia, and in recent times our increased geological knowledge has made this supposition seem more and more probable.

Of course the history of the formation of the several islands is neither uniform in character nor synchronous. Madagascar and the Seychelles appear to be the oldest members of the group; their insulation began in the mesozoic period and is connected with the formation of the extensive sea-basin which is now filled by the

Indian Ocean. These two island districts are old mountain tops which have remained above water, their connexion with the African continent ceasing from the eocene period. The Comoro Isles and the Mascarenes, as well as the small islands lying far out in the ocean, are of volcanic nature and were probably raised above the surface of the water at a later date. The long duration of this isolation has not been without a far-reaching influence on the organic world. The indigenous genera are strikingly numerous, but the animals which immigrated in the miocene period and are so characteristic at present of Tropical Africa, are wanting.

People have tried to ascribe a really ancient character to the human inhabitants, and to explain them as primitive forms standing between the races of Africa and Southern Asia. This was of course overshooting the mark, and the hypothesis did not correspond with the facts of the cases. Modern investigations have led to far more sober conclusions. The settlement of the East African Islands by man is of comparatively late date, having taken place, as regards a part of it, in later historic time, and it exhibits a motley chart of population, as the people belong to very different race elements and to no less than three different quarters of the Earth. No sufficient proof has yet been given of the existence of an autochthonous race. Lying beneath the magical sky of the Tropics these islands display a wealth of natural beauty which has long been renowned and which indeed cannot be surpassed in grandeur.

Some of the islands have long attracted the attention of Europe as suitable districts for colonisation, and just

at present European capital and European enterprise are attempting in an increased measure to inaugurate remunerative colonization in these regions. If, as there is every probability, Africa becomes more effectively opened to European influence, these islands will assuredly come more and more to the front.

CHART OF THE SOUTH WEST INDIAN OCEAN.



MADAGASCAR

CHAPTER I

SITUATION AND EXTENT

THE mighty island of Madagascar, which the French Creoles of the neighbouring Mascarene Isles call La Grande Terre, lies nearly parallel to the coast of East Africa from N.N.E. to S.S.W. The Mozambique Channel, which separates it from the Continent, is some 250 miles across. It is the largest island in the western portion of the Indian Ocean and, if we omit Greenland, is only surpassed in extent by New Guinea and Borneo, being 230,000 sq. miles in extent. Its shape is elliptical, the major axis, running north and south, is 1000 miles in length, while the greatest breadth, at the latitude of Foule Point, about the middle of the island, separates the east from the west coast by 375 miles. It extends over nearly 14 degrees of latitude, from Cape Amber, the most northerly point, in $11^{\circ} 59' 52''$, according to Grandidier, to the most southerly, Cape Ste. Marie, in $25^{\circ} 38' 55''$ S. lat. The positions of these places on the old map by Pedro Reinell, dated 1517, are tolerably near to those given by modern observations. The most westerly point, in the Bay of Fandivotra, lies in $43^{\circ} 11'$ E. long., and the East Cape in $50^{\circ} 27'$ E. long. In comparison with this insular colossus the islands which lie near, as well as those far out in the ocean, sink into insignificance. A visitor receives the most imposing impression by looking at the coasts in bright weather from the eastern side of the island, because there the mountains are tolerably near to the coast. Mountain ridges running north

and south rise in an amphitheatre from the plain on the coast like motionless waves; they get higher and higher, and in the distance, in sharp outline against the blue of the sky, one may recognize the primeval forest of the Upper Mountain region.

The western side of the island is far more level and is thus less impressive.

CHAPTER II

HISTORY OF DISCOVERY AND EXPLORATION

IN ancient times our acquaintance with the surface of the Earth was very limited, and until the beginning of the Christian era practically nothing was known of East Africa beyond Cape Guardafui. In the Second Century two Greek navigators, Theophilus and Diogenes, sailed round this Eastern Promontory and reached a harbour which they called Rhapta. Soon afterwards another sailor, Dioscorides, sailed yet further south and reached Cape Prasum (on the Mozambique coast?). According to the account of these mariners, as Ptolemy informs us, the island of Menuthias lies not far off, and can be reached in two days either from Rhapta or from Cape Prasum, while it is about the same distance to the Pyrolean Archipelago. This latter name points to islands of a volcanic nature and may be held to signify the Comoro Isles, and in that case Menuthias cannot mean anything but what is now called Madagascar, a conclusion rendered still more probable by other items of information. When we are told that Menuthias is covered with forest and possesses rivers, Zanzibar and Pemba are excluded; while the statements that the only wild beasts found are crocodiles, that large tortoises live there and that the natives make use of dug-outs as boats, agree thoroughly with a description of Madagascar.

At the beginning of the Middle Ages the Arabs repeatedly obtained more accurate information concerning the island; the Arabic geographer Edrisi, who collected reports from traders and navigators, mentions in his map

an island called Chezbezat, which is obviously identical with Madagascar. Other Arabic authors use other appellations, as Serendah, or El Komr (Moon-Island).

The first to make use of the name Madagascar was the Venetian, Marco Polo. He never visited the island, but depended entirely on the information of the Arab mariners. It will not be without interest to quote his description word for word. He says: "Madagascar is a large and beautiful island a thousand miles distant from Socotra. It is 4000 miles in extent. Its inhabitants are Moslem and all live by trade. Every day they slaughter a large number of camels for food. In this island, as in Zanzibar, which lies to the south of it, there are more elephants than anywhere else in the world, and there are found there also leopards, lions, giraffes and wild asses.

"The forests abound in red sandal-wood and on the coast ambergris is collected. This is a product of the whale, which is numerous in those seas.

"Many ships sail thither and obtain rich profits from silks and other articles; there is an important trade in ivory.

"Madagascar and Zanzibar are the most southerly islands visited by the Indian mariners, but the current towards the south is so strong that the return voyage is difficult.

"In the countries which lie yet further off is found the 'Griffin', or *Roc*, which is not, as related, half bird and half lion, but is rather a gigantic eagle, which covers with its wings a space of thirty paces and carries off elephants in its talons; these it drops down from a height and then feeds on the crushed flesh. The Khan of Tartary possesses a feather of this Roc, nineteen spans in length, and two wild-boar tusks each weighing fourteen pounds."

We may assume that in these statements of Marco Polo there is a mixture of truth and falsehood. The imaginative Orientals had communicated many gross exaggerations to the Venetian. Many of these statements may, however, refer not to Madagascar, but to Magadoxo on the

Benadir coast, the inhabitants of which, like all the Somali, breed camels for food. Lions, giraffes and wild asses are frequent on the East Coast, but are not to be found in Madagascar, nor is ivory to be obtained there.

On the other hand, the account of a giant griffin receives some real support from the discovery of the remains of gigantic ostriches (*Epyornis maximus*, *E. ingens*), which once inhabited Madagascar, as these huge cursores were apparently still living in those days, or at any rate they still lingered in the memory of the people. If we consider how fond the Arabs are of exaggeration, we shall understand these strange additions to the simple facts. Of course the *Æpyornis* could not fly; the so-called feathers of which the Khan possessed a specimen, were, according to the opinion of Grandidier, which appears very probable to me, nothing but bamboo stems which the Arabs considered as the shafts of large bird feathers. The 14-pound tusks also cannot be accepted as coming from the island; they were either hippopotamus teeth, or, as appears to me more likely, the huge tusks of the East African wart hog (*Phacochoerus æthiopicus*); these are often offered for sale on the sea-coast as curiosities.

It was in the beginning of the Sixteenth Century that more accurate information was first obtained in Europe. The epoch-making expeditions of the Portuguese under Vasco da Gama and Bartholomew Dias had reached the south point of Africa and had discovered the sea route to India by the end of the Fifteenth Century, and thus, through the neighbouring Arab traders on the Mozambique coast, had heard also of Madagascar.

In the year 1505 King Manuel of Portugal fitted out an expedition of 22 ships and 15,000 men. This sailed in March 1505, under the command of Dom Francisco de Almeida, the first Viceroy of India, and was commissioned to establish fortresses for the protection of the Portuguese trade in Sofala and Quiloa. In the follow-

ing year Almeida sent ships back to Portugal with spices as a token of his successful voyage; these ships were commanded by Fernando Soares, and on their home voyage from India they reached the east coast of Madagascar, Feb. 1st, 1506, and thus Soares is the real discoverer of the island. On the 10th of August of the same year 1506, the Portuguese João Gomez d'Abreu discovered the west coast of Madagascar and sailed into the Bay of Formosa, probably between Point Barrow and Point Croker. As it was the day of St. Lawrence the island received the name of San Lorenzo, and this appellation is generally given to it in the maps of the beginning of the Sixteenth Century. The navigator Tristan da Cunha received information about the island from one of his captains, Cuntinho by name, who had to put into a harbour in Madagascar for shelter; he then visited several points of the west coast and reached the north point, which at first he designated Cape Natal.

Gomez d'Abreu after rounding the most northerly Cape, sailed along the east coast, landed near Matatane and even left some Portuguese behind on the coast, where in the following year, 1509, Diego Lopez de Sequeira effected another landing, afterwards sailing along the coast as far as the Bay of San Sebastian. Thus different points of the island became known in rapid succession and were visited by the Portuguese on their voyages to India. There was, however, no permanent occupation of the island, perhaps only for the reason that the Portuguese already had sufficient colonial possessions in South America, Africa, and Eastern Asia. Between 1595 and 1598 the Dutch landed in Madagascar, but were apparently frightened away by the heavy losses sustained by their crews.

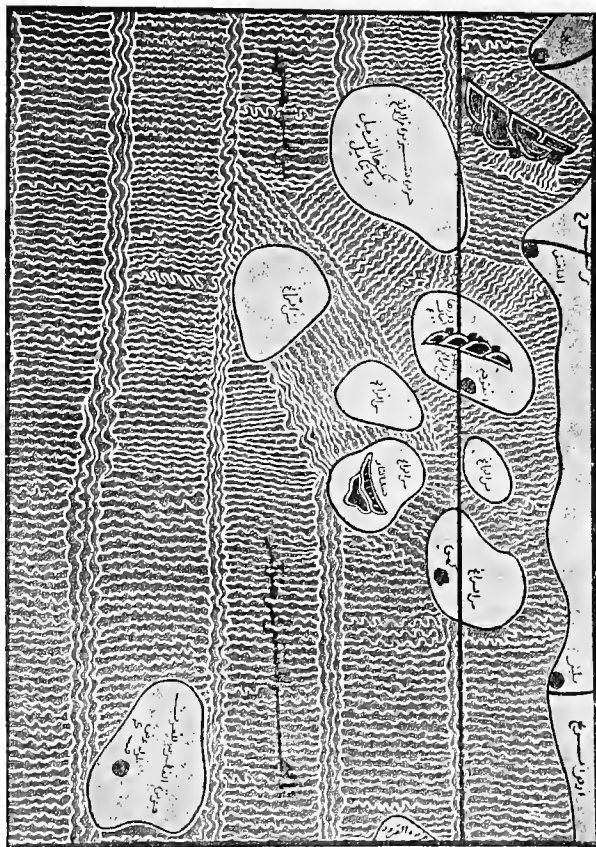
Towards the middle of the Seventeenth Century there began, as will be described later, attempts at colonization on the part of the French, who designated the

island "Ile Dauphiné," an appellation which did not, however, gain permanent acceptance.

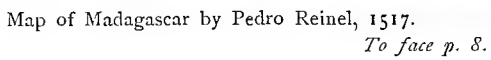
The name of Madagascar seems to be of foreign origin, coming probably from East Africa. The Malagasy themselves did not know this name originally, and when they wished to designate the island as a whole they used different circumlocutions, as, *Izao rehetra izao* or *Ny tany rehetra*, i.e. "all this country", or even *Ny anivon ny riaka* (literally "in the country that lies in the midst of the sea"). It is peculiarly interesting to us that early travellers give us wonderfully glowing accounts of the island and of its marvellous fertility, and sometimes consider the inhabitants as the happiest people on the earth.

The growth of our knowledge of the district can be accurately followed by means of the numerous maps in existence, most of them, however, of doubtful value. Alfred Grandidier has taken the trouble to make a collection of these maps and to reproduce them in an excellent manner in numerous pages of his "*Histoire de la Géographie de Madagascar*." The map by Edrisi of 1153 is in great degree a product of the imagination, and even Martin Behaim, who depended upon the confused information of Marco Polo, gave quite an arbitrary shape to the island on his globe. The first useful map, the first which gives the general outline of the island with any correspondence to the reality, is of the year 1517. It was executed in Seville by the celebrated Portuguese geographer, Pedro Reinel. A great number of later maps are obviously only copies of this, and even the large scale productions of Flacourt (1656) and of Benjowski, so renowned for his extravagances, are obviously based upon the map of Pedro Reinel.

We may recognize a real advance in the cartographic sketch of d'Après Manevillette (1775). It is confined to the circuit of the coast and gives no kind of topo-

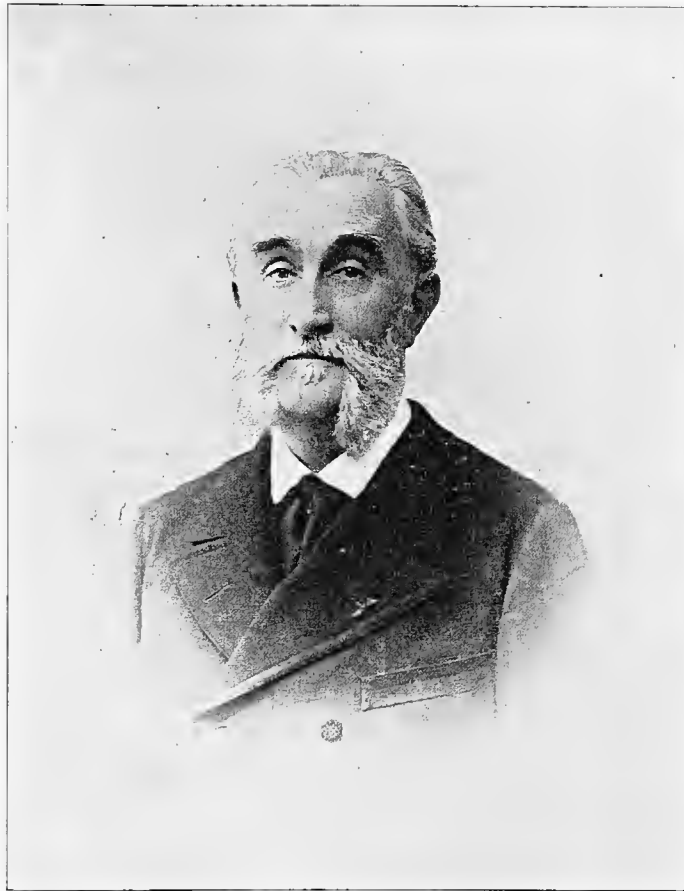


Madagascar and the East-African Islands, after Edrisi, A.D. 1153.



To face p. 8.

graphic details as to the still wholly unknown interior. We are indebted for important details to Owen, who in 1824



Alfred Grandidier.

made accurate observations of the west coast and of parts of the east coast.

Just as at an earlier time certain mountain tops in the interior were inserted at pleasure, so now, even up to the

middle of this century a mountain chain running north and south was worked in, which must in its turn be regarded as purely fanciful. It appears in a map published in the year 1840, in accordance with the information of Leguével de Lacombe, with elaborate details, but it is a pure invention, Grandidier having obliged the so-called traveller to acknowledge that he had never left the east coast and that his descriptions, in spite of their minuteness, were evolved from his own imagination.

In the years 1865—1870 the French geographer, Alfred Grandidier, travelled through the island in many different directions, and we are indebted in the highest degree to his assiduous investigations for our present knowledge of the large island. His sketch-map, published in 1871, is the first to give an account of the topography in accordance with fact; in the year 1865 he undertook an accurate triangulation of Imerina, the central province, which was continued by P. Roblet. Grandidier's book of travels, magnificently got up, numerous splendid volumes of which have already appeared, must always stand out as a pattern of geographical excellence and must serve as the basis of all future works on Madagascar. Subsequently (1875) Mullens brought out a map of the Betsileo country, and Gautier extended our geological knowledge. The English missionaries have made many contributions to our knowledge of individual localities and their inhabitants; of these James Sibree, A. Shaw, W. D. Cowan, J. Richardson, A. Walen and R. Baron must be especially particularized. Their observations are chiefly to be found in the "Antananarivo Annual and Madagascar Magazine," a periodical printed in the former capital of the Hova, which forms a rich mine for the ethnology of the Malagasy.

The peculiar and abundant Flora and Fauna have also manifold attractions for Physicists. As early as the last century Philibert Commerson wrote with ecstasy of

the impression made on him by the aspect of Nature in Madagascar. Sonnerat first made us acquainted with the wonderful aye-aye (*Cheiromys*). About the middle of this century followed Sganzin (1840), Bernier and Goudot, and later J. Vinson, Lantz, Pollen, Hildebrandt, Rutenberg and Keller. At a more recent period Catat and Maistre obtained abundant additions to our knowledge in regard to Natural History, and G. Müller entered upon the investigation of the extinct Fauna. Unfortunately, however, he was murdered in the northern part of the island, after a most promising commencement of his labours of exploration. Dr. A. Völtzkow, the German traveller, was more fortunate. He has recently visited different regions of Madagascar and is now publishing his discoveries in the Proceedings of the Senkenberg Natural History Society.

CHAPTER III

SURFACE AND GEOLOGICAL STRUCTURE

IN the earlier accounts of Geographers the physical condition of the island was for the most part described erroneously; it was accepted that a central range of mountains ran from north to south. According to Grandidier, this sierra-like ridge of the older maps is non-existent, in spite of the fanciful details of Leguével de Lacombe. On the contrary, the middle of the island is occupied by a plateau, stretching from the north to about the 22nd parallel and built up of primitive rocks, granite and gneiss. The breadth of this elevated zone varies. In the province of Imerina it extends to 80 miles, but becomes narrower towards the south, where it is terminated by a tranverse chain of mountains on the border of Betsileo-land.

The edges are higher on every side than the land lying between them, so that we may speak of a central depression. The descent towards the east and the west is rugged, especially towards Sakalava-land. The mean height of the interior plateau is roughly 5000 feet, but it rises to 8000 feet to the S. W. of the town of Antananarivo. The watershed does not lie in the middle, but near the eastern coast. The descent on the east is by three successive steps, the furthest inland of which is the most important. At the precipitous edge occur mighty table mountains, like natural fortresses, such as Isahazavona in the Tanala region, and Ikongo, which is 5 miles long and has a precipitous descent of 1500 feet.

In the north, in the neighbourhood of Lake Alaotra,

these three steps unite. The watercourses on the eastern side are rapid and often form picturesque waterfalls in the mountain region.

Towards the west of the island the descent is divided into four steps, it is thus less rugged and easier to cross; the streams attain greater length and have a more gentle current, yet even here there occur isolated precipices. One of these on the 18th parallel has a fall of 2500 feet.

This formation of the ground produces a natural division into three districts, which we denote as the Eastern, Central, and Western regions. Each has its peculiar character as regards topography, botany, and zoölogy.

The *Eastern Region* is very mountainous in the interior. It stretches, with an average breadth of 60 miles, from Diego Suarez to Fort Dauphin.

Here and there, as, for example, some 6 miles behind Tamatave, quartz, gneiss, and mica slate come to the surface, forming little valleys with a covering of black mould, the slopes being generally thickly covered with red *löss* * which in the rainy season makes progress very difficult. As the deeper valleys between the undulating hills are generally marshy, the villages have to be built on the slopes. The frequent and copious rains bring about a great wealth of rivers and streams, which at times attain a considerable breadth, as, for example, the Ivondrona near Tamatave. The course of the rivers is always a short one and their navigability is consequently very limited. Their total length also is of no great amount, because the watershed approaches very near to the east coast. Among the numerous watercourses of the Eastern Region we may here mention: The Mahanarabe in the north, the Maningoro which drains the great lake basin of the Alaotra, the Ivondrona with its extensive lagoons which falls into the sea south of Tamatave, the

* This is a red marl, found along the Elbe and the Yang-tse-Kiang, but not in England.

Mangoro, the Matitatana which issues from the mountain range in a stately waterfall 450 ft. high, the Mananara, and the Manamboro in the extreme south.

One peculiarity of the eastern side is that the mouths of the rivers are encumbered with sand bars produced by the breakers. These give rise to large shore lagoons or even regular lakes, which are much used by the natives for fishing. They lie in a chain extending for 225 miles and could easily be connected by canals so as to form a valuable waterway.

The east coast, although fertile and displaying a quite astonishing wealth of vegetation, is singularly poor in bays, and is thus not of very easy access for ships. From Foule Point to Fort Dauphin in the south there are only open roadsteads, for the coast runs almost in a straight line for a stretch of 500 miles. There are, on the other hand, larger bays in the north, as the great Bay of Antongil, at which settlements may perhaps arise such as existed in old times.

Vohemar possesses a small well-protected harbour with healthy surroundings, and is regularly visited by the steamers of the Zanzibar line. Quite in the north lies the Bay of Diego Suarez, six miles each way, with good anchorage. The entrance is easy and yet narrow enough to afford protection against the force of the waves during a storm. The margin of the bay, grown over with mangrove forests, gives it a strategic importance, as men-of-war could easily be concealed there. The land around, however, is desolate and exposed to every wind. Immediately behind the edge of the coast, the land is flat, but towards the interior the transition to the mountain region is formed by undulating hills. The eastern portion of the island has undoubtedly an important future for colonising enterprise. Tamatave, a town of 20,000 inhabitants, is the only seaport.

The *Central Region* is a chaos of mountains and valleys,

in form not unlike a stormy sea. Long stretches of ground are covered with a glittering red clay, from which granite and basalt project, but in some places there are green plains of fertile alluvial soil. J. Sibree reports upon the general impression of the higher country in the following words: "A great part of the mountain region of Madagascar is bare desert land of dreary aspect. The lines of undulating hills are grown over only with coarse grass, which gets brown and dry towards the end of the seven months for which the rainless season lasts; but the valleys often display a luxuriant tropical vegetation, associated with the bright green of the rice fields wherever the locality is inhabited. If the mountain landscape is not wanting in a certain grandeur, it is indebted for this to the unusually extensive views over the country to be had from many points, the clear pure air causing the most distant objects to stand out sharp and distinct. But apart from these distant prospects there are many places in the mountain region which claim our admiration for their picturesque scenery. The view of South Betsileo-land filled me with ever new transports of delight. To the south appeared a group of mountain tops, peak behind peak, and all of different shapes. One resembled a ruined tower, a second had a ridge cut out like a saw, another was like a mighty pyramid rising by gradual steps, and a fourth like a gigantic dome. The highest points were for the most part veiled in cloud, and many of them rose at least 3000 ft. above the plain."

The most remarkable elevation that we met with in Madagascar was in the Middle Province, the Mountains of Ankaratra. It is true that it has not so impressive an effect as we might expect from its height above the sea, for it rises out of the plain of Imerina, which has itself an elevation of 4000 ft., yet its five stately cones are visible from a great distance. The highest of these

peaks is called Tsiafajavona (i.e. "whose summit no cloud can reach"); it is 8705 ft. in height.

Another group of mountains, consisting of a number of volcanic cones, is situated to the south-west of the capital, on the Itasy lake. Dr. Mullens writes of this: "When we ascended the high mountain that looks over the western part of the lake, we suddenly saw before us, to our great surprise, crater after crater. Some were of enormous size, others small, some were cone-shaped, others formed cavities, and others again were of horse-shoe form with high ridges of lava on the open side. The number of these craters may certainly be put down at 40, but we consider it very probable that there are others still further north. We came upon other volcanoes fifty miles further south. We ascended Ivoko, a high rounded hill, and discovered on reaching the top that we were on the edge of a crater. This cavity has an internal breadth of a quarter of a mile, the edge is 1000 feet above the plain. Two streams of lava on the west flowed in a southerly direction."

Quite in the northern part of the island the Ambohitra or Amber mountain forms a considerable elevation. It is 4500 ft. high and is visible from a great distance.

Lakes of great size are not numerous in Madagascar, but they are to be found. There is the Alaotra lake, at a height of 1500 ft. in the land of Sihanaka. This appears formerly to have had a much greater extent; its present length is put down at 26 miles; and there is a second in Imerina. The Itasy lake with its surroundings comparable to the Phlegrean Fields, is only 8 miles long.

The *Western Region* is comparatively flat, becoming hilly towards the interior; it is traversed by low mountain ranges, and the elevation is more considerable towards the south than in the west. The rocks here belong to the chalk formation, besides which there are found deposits of jurassic and eocene limestone lying

in horizontal strata similar to those on the continent of Africa. The rainfall being less copious, the soil is far less fertile than on the eastern side. It has more the character of a steppe, and the land most suitable for cultivation is found on the banks of the rivers. The land in the south and south-west consists of a wretched plain, barren sand or sparse bush predominating. In Menabe it becomes somewhat pleasanter and more fertile. In the north, volcanic formations crop up, low cones of basalt breaking through the horizontal strata of the sedimentary rocks. The volcanic rocks can be traced beyond the island as far as the Comoro Islands; the island of Nossi-Be, for instance, which is of entirely similar character to Madagascar, exhibits many craters filled with water so as to form circular lakes, besides the granite masses of Locubé.

More extensive highlands are to be found between the rivers St. Vincent and St. Augustine. The most northerly of these was visited by Grandidier. It is terminated on the east by the picturesque Isalo range in which there are precipices 1200 feet high.

The western rivers have a longer course than those in the east, on account of the greater distance of the watershed from the coast; not unfrequently they become considerable streams. The mightiest of these is the Betsiboka with its tributary the Ikopa; it rises in the high land of the Imerina Province, and after a course of 300 miles falls into the wide bay of Bembatoga; river steamers of moderate draught can ascend it to a distance of 90 miles from the mouth. To the north of this river there is the Majaruba. Further south there are a few good-sized streams, as the Manambolo, the Mangoka or St. Vincent River, and the River of St. Augustine with its broad estuary. The coastline on the western side is richly diversified, having numerous large and well-protected bays.

In the north the bay of Passandava, forming a back-

ground to the island of Nossi-Bé, cuts deep into the land. Next, to the south, comes Bafala Bay studded with the Radama islands, then Narinda Bay, the broad Bemba-toka Bay, the Gulfs of Baly and Buëni, the Bay of Tullear (Tolia) and lastly the Bay of St. Augustine, girt with mangroves.

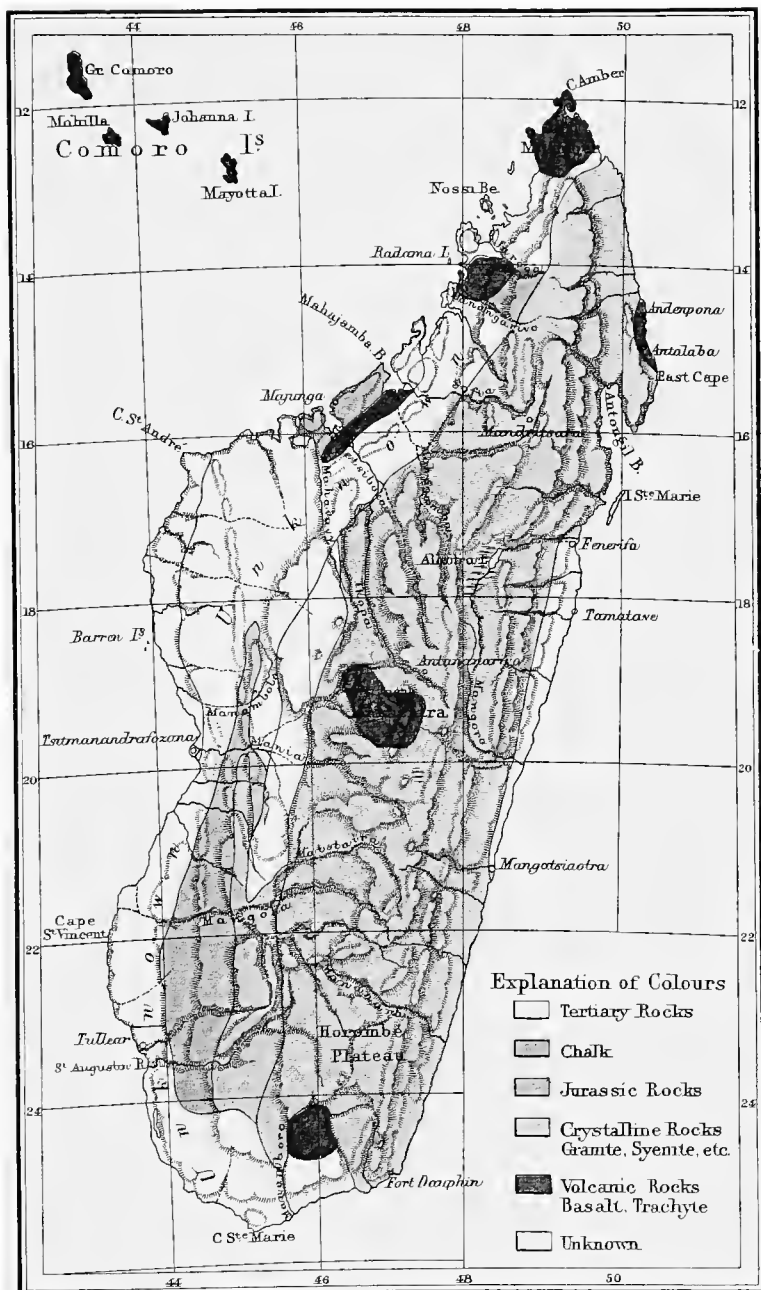
THE GEOLOGIC STRUCTURE of the island of Madagascar displays to us in the first place a nucleus of granite and gneiss in the interior; this rests upon a submarine base and comes to light in the central mountain region wherever it is not overlaid with alluvial soil.

We have apparently to do with an old mountain summit which remained standing when the mighty basin of the Indian Ocean was formed. Certain fragments have remained standing in the region of disruption, as, for example, the island of Nossi-Bé which appears to be closely connected with the west coast and exhibits a primitive rock formation. The Radama islands and Juan de Nova are similar fragments. The long and sharply marked parallel terraces stretch in a north-easterly direction and appear to be continued, with interruptions, as far as the Seychelles.

With the exception of isolated patches of soft sandstone the later sedimentary rocks are entirely wanting in the interior. Near Sirabé there is a local layer of limestone which is made use of for building purposes, but its geological character requires closer investigation than it has yet received. In the south of Belsileo-land a slate is found which is turned to account in the arts. In the south-west the land of Bara has a desolate chaotic character, but appears to be chiefly granitic, while the Isalo-mountain, between $22^{\circ} 10'$ and $22^{\circ} 25'$ S. lat., forms a sandstone plateau deeply furrowed by water-courses.

There are many kinds of volcanic rocks overlying

GEOLOGICAL MAP OF MADAGASCAR.



Explanation of Colours

- Tertiary Rocks
- Chalk
- Jurassic Rocks
- Crystalline Rocks
Granite, Syenite, etc.
- Volcanic Rocks
Basalt, Trachyte
- Unknown.

Scale: Surveyed by the French Government

Printed by W & A. K. Johnston, Edinburgh & London.

Scale 1:10000000

0 60 120 180 240 Miles

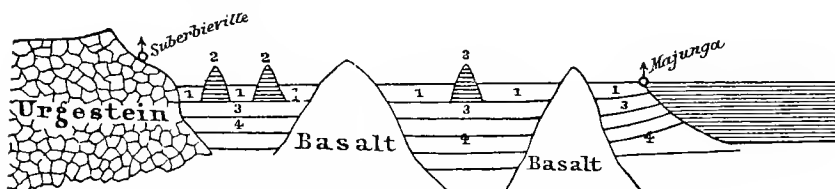
the primitive formation of the region of high land; the earlier subterranean activity was obviously widely spread. It has already been stated that numerous volcanic cones occur in the neighbourhood of the Itasy lake, and according to Dr. Mullens, about a hundred extinct volcanoes can be observed in that region, within a circuit of 96 miles. In some places the lava looks as fresh, as black and as sharp as if it had but just burst out from the crater. Though the volcanoes are not at present active, there is a tradition among the natives that their ancestors had seen great flames there in olden times. The lofty Ankaratra mountains are also extinct volcanoes. The Rev. Mr. Campbell remarks that large quantities of scoriæ lie scattered around and convey the impression that the region has been a great smelting-house. Lava detritus also occurs in the south-east, and broad streams of lava extend as far as the sea-coast.

Extinct volcanoes are also mentioned in the north, in the land of the Sihanaka. According to the statement of Kestell-Cornish, several lava masses of quite recent appearance descend to the sea in the north-west, and the volcanic soil is known to extend beyond Nossi-Bé to the Comoro isles.

While later eruptive rocks and primitive mountain masses of great antiquity lie upon the upper part of the pedestal of granite, there are genuine sedimentary rocks lower down. These are mesozoic as well as early tertiary strata of marine origin (eocene). Traces of these, however, only exist on the west side, while on the eastern side formations of this kind appear to be entirely wanting. Vinson indeed asserts that he has seen sedimentary strata on this side, full of fossil remains, but others have been unable to discover anything of the kind.

In Betsimisaraka I have only been able to observe mighty layers of "löss" along the rivers and in the few

places where the rock became visible it was granite or quartz with good-sized masses of rose quartz. The case is quite different on the western side, on the geological conditions of which we have been informed principally by Grandidier and Gautier. From Nossi-Bé, where nummulitic limestones occur, there begins a broad strip of mesozoic (calcareous and jurassic) and eocene rocks which surrounds the granitic high land on the west, bends round on the south and extends as far as Fort Dauphin. The stratification of these sedimentary rocks does not appear to have suffered any disturbance. In the nummulitic limestones of the eocene period are found al-



Geological Section from Majunga to Subervieville (after Léon Subervie).

1. Recent alluvial formations. 2. Early alluvial deposits. 3. Calcareous rocks.
4. Jurassic rocks.

veolina, nummulites and *Velates Schmidliana*. As can be seen in the accompanying diagram the jurassic deposits and calcareous strata in Bembatoka Bay reach from Majunga to Subervieville, but are broken through here and there by masses of basalt. In the south-west, in the valley of the River St. Augustine, are found strata rich in fossils, which probably belong to the lower greensand. Richardson found ammonites, terebratulas, turitellas and petrified echinoderms.

E. Suez remarks concerning the geologic past of the island, that India, Madagascar and South Africa bear the marks of having been once united into a single tableland. A rupture from India took place during or after the lias period, and from South Africa some time earlier

than the time of the lower greensand, at a period that cannot be more exactly indicated.

Concerning the formation of the marine chalk deposits in Western Madagascar, the same author writes as follows: "At the time of the Middle and Upper Chalk a wide open sea stretched from Europe over the desert, over Arabia, perhaps over Somaliland, (that Somaliland belonged to the once existing Ethiopian middle sea has been since shown by Keller to be indisputable) and South European Chalk deposits penetrate into the interior of the East Indian tableland in the Valley of the Nerbudda." This chalk sea apparently reached Madagascar, but only the Western side. During the eocene period it was still spread over a great part of East Africa and North West Madagascar.

Then followed a subsidence of the coast line.

Among other formations coming down to the present time the coral reefs must be mentioned. The information hitherto available is based on the earlier accounts of Captain Owen and Dr. Allan; these accounts have passed into the well-known works of Darwin, but in many points they do not appear to me to be well established. Thus, I find indicated on the maps a long fringing reef which is supposed to stretch without interruption from Tamatave to Cape Amber in the north of the island, and then to go on and fringe the island of Nossi-Bé. It is impossible, considering the mode of growth of the coral, from first to last, not to doubt the existence of so continuous a reef. The coral polype is emphatically a salt-water creature which cannot endure a dilution by fresh water; now as numerous streams descend from the eastern slope, these must prevent the formation of coral at their mouths.

This continuous reef does not in fact exist, though there are isolated reefs. Point Hastie near Tamatave is fringed by a mighty coral bank, but near it, to the

north, I found a sandy beach. The island of Ste. Marie exhibits reefs and so does the opposite mainland. The harbour at Vohemar is rich in coral, while the edge of the coast to the south of it is everywhere sandy. Near Diego Suarez there are no continuous coral reefs; on the other hand, local coral formations occur on the shores of Nossi-Bé, as, for example, in the bay near Locubé, but in other parts, owing to the mangrove vegetation, they are not found.

On the western side genuine reefs occur more sporadically, and as yet we know but little of the coral reefs in the south, which appear to be of small extent.

In beauty the coral constructions of the coast of Madagascar are markedly inferior to those of the Pacific Ocean and the Red Sea. The splendid colouring is wanting and dull brown tones prevail in its stead.

I met with knotted millepores and allarias of very numerous species, besides branched madrepores, and lofty species of galaxea mingled with brown beds of xenia and elegant chocolate-coloured ammothœa like miniature trees. There is an alcyonid of tubular structure, peculiar to this district, which frequently occurs near Nossi-Bé, but is only to be found in a few European museums. It is the *Cælogorgia palmosa* and forms reddish brown shrubs.

CHAPTER IV

CLIMATE

IN the course of recent years accurate observation of temperature and rainfall have been taken at different points of the coast. In Antananarivo, on the plateau of Imerina, the French missionaries erected an observatory fitted with all necessary apparatus, and they publish their meteorological observations regularly, so that we are tolerably well informed of the climatic conditions. The observatory was unfortunately destroyed during the late war, but is to be set up again.

The position of the island in connexion with the influence of the trade wind determines the general character of the climate, and stress must be laid on the fact that marked differences are exhibited in the different coast regions, the influence of elevation naturally making itself felt.

Let us commence with the eastern coast as being that most frequently visited. There is here no dry season proper, as rain falls through almost the whole year. The months of September, October and November have the lowest rainfall. The sailors say of Ste. Marie, that the island is never seen except in rain, and indeed the amount of rain annually is tolerably high (116 inches).

The month of maximum rainfall is January (16·1 inches), the minimum is in September (3 inches).

Tamatave, with a mean annual temperature of 74·8° F., is still richer in rain. The annual rainfall, as we learn from the *Revue Scientifique*, attains 158·8 inches, and even October, the driest month, has 5·1 inches. The prevailing wind is from the south (66 per cent); then come

north-east winds (13 per cent). West winds are scarcely ever experienced. A series of observations extending over two years gave for Ambahy (Farafanga) an annual fall of 123·8 inches, the highest being in February (21 inches) and March (19 inches). In the north-east of the island there is a marked decrease in the rainfall with an increase of the mean temperature. Vohemar ($13^{\circ} 21'$ S. lat.) has a mean annual temperature of $77\cdot7^{\circ}$ F. and a rainfall of 58·6 inches. Diego Suarez ($12^{\circ} 14'$ S. lat.), with a mean temperature of 80° F. has only 27 inches; 11·5 inches were observed in January, 9·7 in July.

As regards the extremes of temperature for the year on the east coast, 94° F. is given as the maximum, 50° F. as the minimum.

Things are quite different on the west coast. In the first place there is a distinct dry season. Towards the south the rainfall diminishes scarcity of rain and aridity, so that the steppe vegetation has in many species developed special apparatus for storing up water. Nossi-Bé in $13^{\circ} 15'$ S. lat. has a mean temperature of 79° F.; in April it rises to 81° and falls to 75° in July. The annual rainfall is less than on the eastern side, being only 101 inches. In Majunga, while the conditions of temperature are almost identical with those just named, the annual rainfall is reduced to 64 inches. Nossi-Bé in the south-west has only 14 inches of rain in the year, the mean temperature rises to 84° F. in February, but falls in July to 60° .

In Central Madagascar very accurate observations were taken at the observatory of Antananarivo, 4500 ft. above the sea. The mean annual temperature amounts to $64\cdot7^{\circ}$ F. The absolute maximum $88\cdot5^{\circ}$ was observed on Nov. 7th, 1894, the absolute minimum $38\cdot8^{\circ}$ on the 21st June, shewing a difference of temperature of $49\cdot7^{\circ}$. January with a mean of $68\cdot5^{\circ}$ is the warmest month, while July with $58\cdot1^{\circ}$ shews the lowest mean temperature.

The annual rainfall for Antananarivo is given at 53·7 inches. The rainy season begins in November and ends in March; in these months there is an average rainfall of 9·7 inches. The dry season lasts from April to October, with an average monthly rainfall of ·71 inches only.

The prevailing winds are south-east (38 per cent), east (32 per cent) and north-east (12 per cent). South-west winds blow but seldom (1 per cent) and north and west winds are not frequent (3 per cent).

The beginning of the rainy season is announced by cirro-stratus and cirro-cumulus clouds. Fierce gusts of wind break the calm, the storm clouds discharge torrents of rain accompanied by heavy thunder, generally between four and five o'clock in the afternoon. In the evening the thunder becomes less violent, but the rain lasts till 10 or 11 o'clock. Every year lightning demands its victims, so that people have found themselves obliged to place lightning conductors on the houses.

The abundance of rain that falls during a single tropical storm, is evidenced by the fact that, according to measurements taken by P. Colin on February 1st, 1892, 4·25 inches of rain fell in 15 hours.

The cyclones or whirlwinds which occur during January and February in the Indian Ocean, often reach the island of Madagascar.

They hurl large vessels on the shore, and their devastating effects are felt even in the interior. In the forests extensive districts are laid waste, and trees are overthrown or torn up by the roots. The marks of these disasters, however, are quickly obliterated by the marvelously rapid growth of tropical vegetation.

The fallen giants of the woods are instantly seized upon by a busy army of ants and termites; in an incredibly short time they seem to be changed into touchwood, and soon a new growth of forest trees springs up in the place of the old.

In the dry season there is a very sensible fall in the temperature. In the eastern mountains the air is fresh during the night, dew is formed abundantly, and thick mists rise in the early morning from the valleys. In Antananarivo the thermometer falls to 41° , in the plain of Iazolava a fall to 25° was observed, so that the water was covered with a crust of ice.

The climatic conditions given above appear to hold generally in the district of Betsileo, south of the high land. In Fianarantsoa 4800 ft. above the sea-level the mean annual temperature is somewhat lower than in the province of Imerina, viz. 63.8° . July, the coldest month, has a mean temperature of 56.8° , and the rainfall amounts only to 40 inches in the year.

In order to be able to make a proper estimate of the prospects of future colonization, it is by no means unimportant to state the experience hitherto obtained as to the adaptability of man to the climatic conditions detailed above.

From this point of view Madagascar has not hitherto stood in the best repute. Its fevers are dreaded and have given to the country the name of the White Man's Grave. Considered, however, without prejudice, Madagascar is better than its repute. The conditions are neither better nor worse than elsewhere in the tropics.

It is not to be gainsaid that unhealthy, fever-haunted stretches of country exist, especially in the low-lying districts along the coast. This holds of the eastern as well as of the western coasts, for on the former, during the last campaign, the French troops suffered much in the Bet-siboka Valley; but it is equally certain that there exist other stretches of coast which present but little danger to a European, provided he understands how to regulate his manner of living. The cooler highland is of course far more suitable for him. On the whole we may accept the conclusion of Grandidier, that the conditions of health

are about the same as those of Réunion and Mauritius, where Europeans have thriven well for a long time past.

Very recently these conditions have been made the subject of special study by Dr. Lacaze, and he has made accurate investigations of the district between Majunga and the Central Province. We extract the principal data from his information.

The diseases which are principally treated of are marsh fever and dysentery. Of 107 Europeans who had spent on an average a year and a half in Madagascar, 6 succumbed to marsh fever. The time during which the fever can be resisted is short. In Boina, on the western side, all Europeans had attacks of fever in the first year, generally in the first month, but with regular diet the organism completely adapts itself to the new surroundings.

In the winter months the number of fever cases somewhat increases, and they are especially numerous in May, when the south or south-east winds set in. Excessive muscular exertion and long exposure to the open air favour these attacks. At a greater elevation the frequency of the attacks of marsh fever diminishes, though even among the Hova of the Central Province many individuals have been met with suffering from recurrent attacks and their accompanying symptoms (enlargement of the spleen and anæmia). Among preventive measures physicians recommend a careful choice of one's dwelling-place, which should be situated as high as possible, and should have its entrance protected from the wind. Small doses of quinine taken every other day have been found serviceable.

Dysentery, on the contrary, increases in frequency with the height above the sea, and, unlike marsh fever, appears especially to attack the natives, while the Europeans are less liable to this disease. During three years only three cases were reported among the Europeans employed in the Suberbieville gold-mine, and

even in these cases the individuals attacked had already suffered from it before coming to the country.

Typhus often shews itself as an epidemic among the natives in the Central Province.

Observations as to other tropical diseases have been made at Beri-Beri on Nossi-Bé. The Natives often have ulcerated wounds on the lower limbs (*ulcère malgache*) in consequence of neglect, but these heal quickly; this disease seldom affects Europeans. Leprosy is especially frequent among the Hova, far more than among the Sakalava.

Tuberculosis seems to be widely spread and to take a rapid course. A European who already has the seeds of the disease, should avoid the climate of Madagascar, which, as experience shows, accelerates its development.

Venereal diseases are very largely spread in Madagascar; syphilis especially has gained an entrance among the Hova, though in a mild form; half-castes are strongly affected by it, while the Sakalava have for the most part remained free from this disease. The indiscriminate intercourse of the sexes, combined with carelessness during the period of sickening, has caused this disease to take a strong hold upon the people and has had in many ways a prejudicial influence on the fecundity of the race.

CHAPTER V

FLORA AND FAUNA

THE isolation of the great island, which has lasted for long geological periods of time, has had a far-reaching influence on the forms of its organic life. This has taken its own course in its further development, in accordance with that tendency to change which is possessed by all living beings. From this point of view the plants and animals of Madagascar are especially remarkable, and the island is uncommonly rich in strongly specialized forms, indigenous only to this region. The animals, for example, are so peculiar and so different from those of Africa and Asia, that Madagascar might well be treated as forming a zoological region of its own.

There exist certain points of agreement with Africa and also with Southern Asia, which are intelligible on geological grounds, for the island was still in connection with both these regions until the Tertiary period.

Let us first describe the plants. This subject has been thoroughly worked out by Grandidier and Baillon together, so that we are acquainted with some 2500 species of plants found in Madagascar. The conditions of the island are not everywhere equally favourable to vegetation; there are, as we know, in the south, on the west coast and in the extreme north, barren tracts of a wretched character, but where, as on the eastern slope and on the belt of land along the coast on the eastern side, there is a superabundance of moisture combined with an extremely fertile soil, a covering of vegetation is developed which can hardly be surpassed in magnificence

anywhere upon the Earth. This splendid exuberance, especially such as is developed in the neighbourhood of the streams, cannot but make an enduring and powerful impression on any one who sees it for the first time.

The flora of the coast is somewhat lacking in the peculiar characteristics of Madagascar; it has the cosmopolitan



Madagascan Screw Palm (*Pandanus*).

tropical character that may be seen anywhere from Cancer to Capricorn. Many seeds and fruits are able to travel over the salt element without injury to their power of germination, and after drifting on the sea currents from distant localities, to grow up on the briny soil of the sea coast. Among the beautiful growths common to the tropics, we may mention the Cocoa-nut palm, the Casuarina, the Screw palm (*Pandanus*) with its dagger-shaped leaves hanging down at the point, and

its long roundish fruit as large as a man's head. Also the majestic Barringtonias, whose cap-like fruits, called by the settlers "bonnets carrés", lie about everywhere on the beach. Lower shrubs and herbs covering large areas have become naturalized on the coasts of Madagascar, such as the lime-leaved hibiscus (*H. tiliaceus*), *Acalypha Indica*, *Euphorbia pilulifera*, the bead tree (*Abrus precatorius*) *Guilandina Bonduc*, and the climbing *Entada* with its jointed pods 3 feet in length; the bushes of *Poivreia coccinea* with its bright red racemes are of striking beauty. A convolvulus with flesh-coloured flowers (*Ipomæa pes capræ*) flourishes in sandy places. Certain plants have been introduced by American trading-ships, such as *Chenopodium ambrosioides*, and *Argemone mexicana*, a yellow poppy which I met with growing in masses upon refuse heaps near Tamatave and Vohemar.

Many tropical fruit trees are utilized by man, as the papaws, mangoes, Jack-fruit trees and guavas which are met with everywhere in the neighbourhood of human habitations.

Mangrove trees grow wherever there are sheltered bays; their knotted grey stems bear a thick crown of foliage; their far-reaching roots are dry at low tide, but are covered by the inrush of the sea water at high tide. Numberless land-crabs make their way about these unhealthy mangrove swamps.

Let us describe the vegetation on the eastern side of the island. Behind the coast line, which is not very characteristic in its forms, we come to a zone of heath land with extensive meadows, moors and swamps. Here flourish elegant club mosses (*Lycopodium cernuum*) mingled with polypodium and mertensia, sometimes forming extensive light-green meadows. In the swamps grow beds of papyrus (*Cyperus æqualis*) as high as a man, while graceful water-lilies (*Nymphæa emirnensis*) cover the surface of the water with their small red flowers;

wherever there is flowing water, the banks are fringed with mighty broad-leaved arums (*Arum colocasia*). In shallow waters is seen the lace tree, peculiar to Madagascar (*Ouvirandra fenestralis*), with its long pointed dark-green leaves, pierced like lattice-work and looking like lace.



Travellers' Tree (*Ravinala madagascariensis*), after Sibree.

Only a league behind Tamatave we may meet with an expanse of water covered with the reddish forked spadices of this remarkable plant. In the small plantations and in clearings is seen the nux-vomica tree, of African origin (*Brechmia spinosa*) which is hung in autumn with fruit of the size of apples. Near to this, but not in great frequency,

is found the tanghinia (*T. venenifera*), not unlike a large oleander. Its branches are densely clothed with bright green coriaceous leaves, and when cut exude a milky sap. The olive-green fruit, of the size of an apple, contains a poisonous kernel whose juice acts upon the heart, and in earlier times was made use of for the ordeal by poison. The tanghinia at one time attained a sad notoriety in the history of the country.

Somewhat further inland we are met by a specimen of the vegetable kingdom which makes a great impression on a stranger. This is the Ravenala of Madagascar (*Urania speciosa*), also called by Europeans "Travellers' Tree". It is a gigantic banana, with leaves arranged like a fan; it seems to like dry situations and frequently grows on bare slopes of the hills. Here the spongy trunk attains no great height, the heavy clusters of fruit, separately not unlike the horns of an ox, are conspicuous between the leaf stalks; the edges of the leaves are usually torn by the wind. The ravenala penetrates even to the primeval forest, but there it acquires quite imposing dimensions. In the struggle for air and light with the giants of the forest the trunk rises to the height of from 90 to 120 feet, and at the same time spreads out its mighty fans, as in triumph, at a dizzy height above the sea of foliage. This plantain has been named the Travellers' Tree because water always collects in the sheathing axils of the leaves, and these have only to be tapped in order to allay the torment of thirst. To speak plainly, I cannot join in the enthusiastic praise that certain travellers have bestowed on these beneficent springs of water, for on closer investigation, not only are small tree-frogs found bustling about in them, but they also hold a marvellous collection of dead ants and grubs.

In the warm moist valleys, but never in close proximity to the coast, the raphia palm (*R. madagascariensis*) forms isolated groups and occasionally large palm forests of

rare beauty. It seems that this species, in marked contrast with the cocoa-nut palm, shuns the sea air. The tree, some 50 ft. high, bears from 6 to 8 fronds, whose tough stems snap off when dead, about a foot and a half from the base.

The full beauty of this palm reaches its perfection at



Raphia Palm (*Raphia madagascariensis*).

the time of ripening of the fruit. The hanging clusters reach a length of 6 feet, and are so heavy that two men can scarcely support the weight of a single branch. From two to three thousand brown palm-nuts, that look as if they were polished, peep out from among the light-green fronds.

The raphia palm is of the greatest value to the natives,

for almost every part of it finds a use; the tough ribs of the leaves serve for the construction of the huts, the fibres, over 3 feet long, form the material for the durable palm-cloth, the raphia straw serves for stuffing pillows, the pulp of the fruit is a seasoning for rice, and is said to be a protection against fever; the orange-coloured pith is cut out to make an agreeable vegetable, and sometimes this palm cabbage of Madagascar (*chou palmiste*) finds its way to the markets of Marseilles and Paris.

As we approach the forest of the mountain region, bamboos present themselves, first one at a time, then in ever increasing numbers, in many places even forming a somewhat broad belt difficult to penetrate. These gigantic grasses, with stems 18 to 20 ft. high, are put to many uses in the domestic economy of the Malagasy. From the twigs the young people plait cages for the birds they catch, and baskets for carrying poultry to market. The yellow stems are worked into water-vessels, grease-boxes, drinking-cups and tobacco-pouches, and even furnish spoons for rice tasting. The bamboo stems also serve for carrying goods, for rafters in house building, for enclosing court-yards, for the construction of fences at watering-places, and the like.

Lastly, it is with the help of the bamboo that the Malagasy expresses his nobler emotions in joy and sorrow, for it is from this that he makes the curious bamboo guitar or *valiha*. This he prepares by cutting with his knife fifteen to twenty strings from the tough outer surface of the bamboo, between two internodes of a large cane, and then stretching them tight.

We now proceed to the terrace-like mountain country, rising ever higher and higher, as the dark masses of the primeval forest begin to present themselves. The belt of forest is double on the east side, but the two strips run together in the north, so that the

belt reaches a breadth of 25 to 45 miles, and behind the bay of Antongil even of 60 miles.

When the traveller, after allowing his youthful imagination to dwell in anticipation on the magnificent scenery of the tropics, first comes to compare the reality with his original idea of the enchantment and the majesty of the forest in East Madagascar, he will experience the pleasant surprise of finding that Nature, in her luxuriant magnificence, has surpassed the most daring flights of his fancy. Here is forest in its highest manifestation, an original product of Nature, in which no man has had a hand, a child of the tropics, which regulates for itself its own growth and decay. Though this first impression is a mighty one, yet it must be confessed that it does not raise that pleasurable feeling of freedom that is awakened by our woods at home. There rests always on the primeval forest something solemn and heavy; we stand beside a chaos that is rather bewildering than restful. In the struggle for space, light, and air, everything presses upwards; the giant trunks are not crowned with leaves till they reach a height of 60 to 90 ft. above the ground, and there they display a confused mass of leaves and branches which lets no ray of sunshine enter, so that a mysterious twilight prevails in the forest. The underwood is scanty, so that it is possible to pass with tolerable facility between the gigantic columns, twined round with their numberless lianas. The only impediments are the fallen trunks of the trees which have not been able to hold their ground under the burden of age, or which have fallen victims to the devastating cyclones.

But these corpses of the forest are cleared away by Nature in an incredibly short time. Millions of voracious ants and termites change the timber into fine dust, which, with the decaying masses of leaves, forms a fertile mould. Wherever in some small clearing a dead trunk has remained standing, the termites or white ants climb up

it into the projecting branches and there these gregarious insects make their black ball-shaped nests of three feet in diameter.

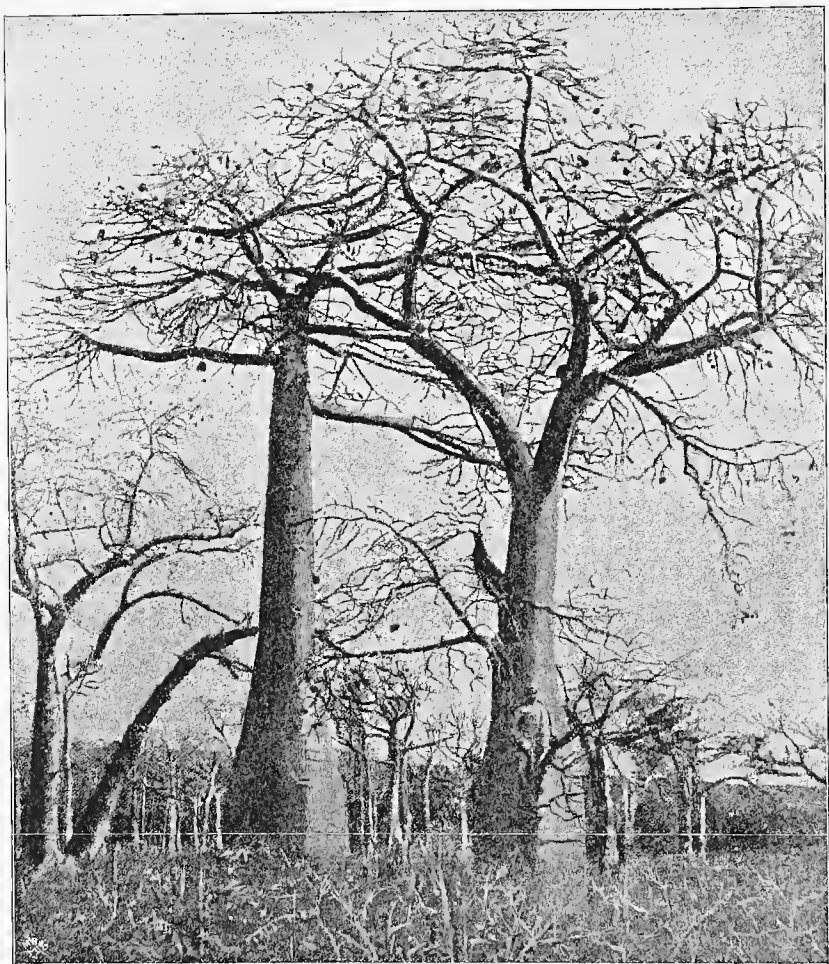
The numerous epiphytes that locate themselves on the trunks form a picturesque element of the scenery in the forests of Madagascar. At the edges of the forest or in the clearings may be seen the luxuriant blooms of the parasitic orchids (*Angræcum*). One species (*A. sesquipedale*) is often brought by the natives to Tamatave, and is thence transmitted in boxes to Europe to form an ornament of the orchid houses. It is now comparatively cheap, but in former times large sums of money were paid for a single specimen.

Among the ferns in the interior of the forest the *Asplenium nidus* stands out in exceptional beauty. This cryptogam plants itself wherever a little mould of rotten wood has collected between the tree trunks and climbing lianas, and looks like a gigantic nest or basket; its dense bright green fronds are three feet in length, and are sword-shaped with entire edges. In the vicinity of the mountain streams stand groups of tree ferns with graceful feathery fronds.

The impressive, well-nigh crushing, solemnity of the forest disappears when one is able to enjoy it during a journey by river, for then the mighty masses of foliage arrange themselves in beautiful and picturesque forms.

Many valuable kinds of timber are found in these regions,—rosewood, palisander, and occasionally ebony. Unfortunately the natives treat these treasures of nature very carelessly; they simply burn down extensive tracts of wood to obtain arable land. This is especially the case in the north, where the forest comes down to the neighbourhood of the sea. When journeying along the coast to Antongil Bay and Vohemar, I saw the sky reddened, night after night, as the enormous conflagrations pursued their work of destruction without interruption.

When we pass the belt of forest and reach the high land of the interior, the character of the vegetation be-



Baobab (*Adansonia Grandidieri*).
(From the *Revue des Sciences*.)

comes quite different. It is true that in some of the numerous glens a luxuriant tropical vegetation is still to

be found, but as a whole the interior is treeless. Grass land predominates, and cattle are very numerous in some localities, owing to the extensive tracts of meadow-land. Reeds and rushes grow with great luxuriance in well-watered places. The stalks of the grasses and rushes are abundantly made use of in central Madagascar, where they are woven into durable mats. Where the land is well cultivated, as among the Hova and Betsileo tribes, rice, in its boundless paddy fields, forms a conspicuous feature of the vegetation. In the neighbourhood of dwellings the courtyards are often enclosed by agaves. The interior of the country is as a whole distinctly monotonous.

The western slope is somewhat different in its botanical character from the eastern, being chiefly bush land, very poor in the south and only exhibiting beautiful meadow-land in Menabé, the best portion of Sakalavaland.

In the character of the Flora we can recognize a connection with Africa in many points. There grows here, for example, a near relation of the dum palm (*Hyphæne madagascariensis*), called Satrana by the natives. In this western region appear also many species of the baobab or monkey-bread tree, which are distinguished as *Adansonia digitata*, *A. madagascariensis*, *A. Grandidieri*, and *A. Za*. In the south grows the *Didierea*, a genus placed by Baillon among the Sapindacæ; it has a cactus-like shape and is 12 feet high. Up to 1200 ft., but rapidly disappearing at that height, the Ravenala or fan-palm appears again and again, and the Raphia palm, sometimes forming splendid forests, grows with striking luxuriance.

The animal world of Madagascar has from the first furnished much matter for surprise to zoologists. It is so peculiar in kind that the dictum of Geoffrey St. Hilaire, that Madagascar forms, as it were, a Sixth Zoological Region of the world, has a good claim to acceptance. We shall consequently treat this subject in some detail.

The geographical position of the island leads us to expect a close relationship between its fauna and that of the neighbouring Continent of Africa, but in reality this relationship does not exist at all. The animals so characteristic of tropical Africa are altogether absent. The numerous families of apes and antelopes, represented so fully on the continent, are entirely wanting. The great beasts of prey—lions, leopards, hyænas—do not pass over into the district of Madagascar. Wild dogs have been at no time met with. It is the same with giraffes, elephants, zebras and rhinoceroses. The hippopotamus and birds of the ostrich kind have become extinct in recent geologic times. Birds, again, who might easily have crossed the Mozambique Channel, are strikingly specialized.

The key to this phenomenon must be sought in the geological history of the island. We know that the animals inhabiting tropical Africa at the present time were originally settled in Southern Europe, and that they spread thence towards the south in the Miocene Period. The vanguard, however, was obliged to stop at the East African shore, for by that time Madagascar had already ceased to be connected with Africa.

Thus the fauna of the island bears the stamp of high antiquity, as it has had to develop itself independently since the Eocene Period. We find among them only peaceful and harmless animals.

Of the higher orders of Mammalia, the apes, as has been already observed, are entirely wanting, while the bats, from the great ease with which they travel, might have reached the island even after its separation. The smaller kinds shew an African relationship. The numberless flying foxes or flying dogs (*Pteropus Edwardsii*) are most in evidence. They especially haunt the coast region, and spend the whole day clinging fast by the claws to the branches of the large trees on the lonely islands.

At dusk they set out for the places on the coast and plunder the fruit trees. Even by day they are very cautious and not easy to surprise. The Malagasy catch them eagerly, roast them on the fire and consider the flesh as a great delicacy.

Of the Rodentia, the brown rat is quite a nuisance from its abundance and audacity; it has of course been introduced in recent times from ships.

Of Carnivora the first to be noticed are the civet cats or viverræ. The beautifully striped *Fossa Daubentoni* is kept by the Indian traders for the sake of its civet, which is taken from its posterior gland with a spoon. The most important beast of prey, one which is dreaded in a perfectly ridiculous way by the natives, is the Pintsala (*Cryptoprocta ferox*), which measures $4\frac{1}{2}$ feet, including its somewhat long tail. The coat, being of a uniform yellow colour, indicates that its habitat is to be sought in the sterile districts of the north and west. The general form recalls the cat, but the anomalous dentition carries us back to an Eocene form and connects it with the extinct Pseudælorus. The existence of the posterior gland indicates a relationship with the viverræ. It is obviously a transitional form between the viverridæ and the true cats. The most striking mammals of the island are the lemurs. They were formerly classed with the true apes as being really quadrumanous, at least in the physiological sense. Some among them, the sifakas, have also the rounded head and the bare countenance of the higher apes. These are, however, mere analogues, partly due to similarity in the mode of life; in reality there exists a deep gulf between the two orders. The form of the skull and the dentition are markedly diverse, and from an embryological point of view the formation of the placenta is quite distinct from that which we find among the simiadæ.

The skin is covered with thick fine hair, the tail gener-

ally acts as a powerful balancing pole, for the lemurs climb nimbly, and in their emphatically arboreal life they make considerable leaps like squirrels. In exceptional cases the tail is quite short, and the fore limbs are at the same time more muscular.



Babakota (*Indris brevicaudatus*).

These animals have none of the impudence of monkeys, and are somewhat uninteresting in captivity.

Lemurs are held in high honour by all Malagasy, and foreigners often get into difficulties when they kill these animals for their skins. The largest species, called Indri or Babakota (*Indris brevicaudatus*), is not quite three feet in length; it is somewhat variable in colour, but the hair

is generally black. The Malagasy looks upon it as the ancestor of his tribe, and to hunt the babakota often entails, at the least, the loss of hospitable treatment. They are numerous in the primeval forest; they remain per-



Bari (*Lemur varius*).

fectly quiet for the greater part of the day and also during the night, but towards 8 o'clock in the morning the whole company gives vent to a perfectly infernal howling, which ceases at the end of about half an hour.

During this forest concert, all nature seems to be in an uproar.

Avahis laniger is dispersed over wide districts of the island. On the other hand there are other genera, as may be understood from their emphatically arboreal life, whose species are confined to narrow limits. This holds, for example, in the case of the long-tailed bare-faced Sifakas (*Propithecus*) about which A. Grandidier and Milne Edwards have published a very complete and splendidly illustrated monograph. The first specimen of these remarkable creatures was brought to Europe by Telfair in 1832; at present we are acquainted with a whole list of species, viz., from the east side, *Propithecus Edwardsii*, *P. diadema* and *P. sericeus*; from the district of the Sakalava on the west, *P. coronatus*; in the north-west, *P. Coquerellii* and *P. Deckeni*; while in the clearings quite in the south lives *P. Verreauxii*, mentioned by Flacourt under the name of Sifaka.

The fox lemurs (*Lemur*) are somewhat smaller and have protruding fox-like snouts. In the woods of the east there is the ruffed lemur (*Lemur varius*), one of the prettiest species, which is often kept in captivity by the natives. It is black with white spots. In the north and in the woods of Nossi-Bé lives the black lemur (*Lemur niger*), which is entirely black. Far the most beautiful representative of the genus is the ring-tailed lemur (*Lemur catta*), which has hitherto only been observed on the western side and is also known under the name of catta. The long tail has broad rings, the colouring of the soft skin is ashen grey with a strong tinge of red, but after death this reddish flush rapidly fades. The yellowish grey or olive-coloured lemur (*Hapallemur griseus*) is not so pretty; the dormouse lemur (*Microcebus myoximus*) is quite dwarfish; it strikingly resembles our dormouse in size and habits, but its mode of life is as yet little known. Two specimens which I brought to Europe alive,

slept all day long with great perseverance, and only became active at the beginning of twilight; their shrill cry is like that of a shrew-mouse.

The most peculiar of all the lemuridæ of Madagascar is the Aye-Aye or finger-beast (*Cheiromys madagascariensis*). This was brought to Europe in the last century



Ring-tailed Lemur (*Lemur catta*).

(1781) by Sonnerat, and his specimen, which is still preserved in the museum of the Jardin des Plantes in Paris, was the only one known in Europe down to the year 1840. The animal was then believed to be extinct, but since that time it has several times come to Europe alive, and it may be met with rather frequently on the east coast, the Malagasy now and then bringing specimens to Tama-

tave. The animal, which is strong and about the size of a cat, reminds us by its long bushy tail of our squirrel, and this resemblance is strengthened by the presence of gnawing teeth; the owl-like head is furnished with yellowish brown eyes and large naked ears as thin as paper. The fingers of the fore limb are exceedingly slender, the middle finger is greatly lengthened and apparently serves



Sifaka (*Propithecus*).

for pulling out alive the concealed larvæ of lucanidæ and cerambycidæ which are laid bare when it strips off the bark of the trees by means of its chisel-shaped incisors.

When newly taken the aye-aye is restless and fierce, but grows tame after a short time. The natives formerly had a superstitious fear of the animal and could with difficulty be induced to capture it; but the considerable sums which were offered have had so enlightening an effect

that good specimens can at present be obtained without difficulty for 40 or 50 shillings.

The order of Insectivora, which apparently embraces mammals of a very early geologic age, is represented in Madagascar by the tenrecs (*Centetes*, *Hemicentetes*). In external habit they remind us of our hedgehogs, the snout protrudes greatly, the tail is rudimentary, the skin is protected by prickles. These animals dig in the earth after the manner of our moles, and are said to pass the dry season, that is from April to November, fast asleep in their places of concealment. This supposition, which has passed into most works on Natural History, does not appear to me to be fully established; at any rate I obtained many living tenrecs in July and August, which did not show the least disposition to fall into a state of somnolence.

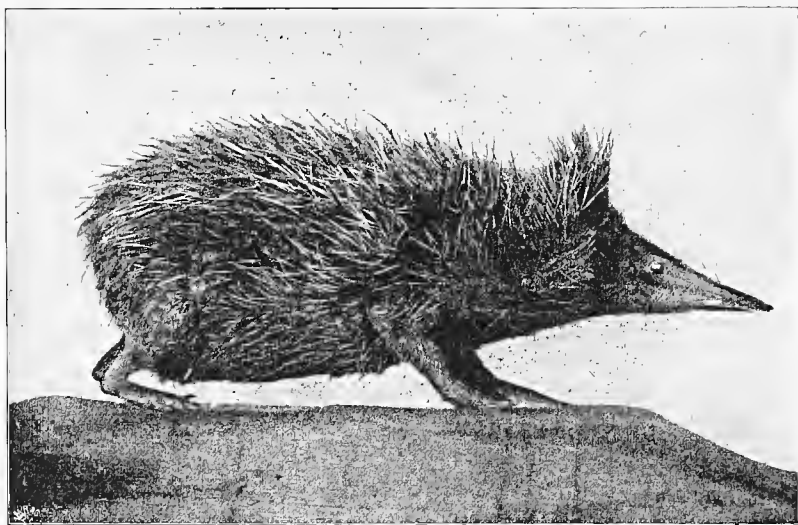
Centetes ecaudatus occurs the most frequently; the smaller *Hemicentetes*, with bright bands on the hind part of the body, is said to be indigenous also in Réunion and Mauritius, but was probably introduced there.

The Ungulata are absent, with the exception of one representative of the wart hogs (*Potamochoerus Edwardsii*). These wild swine live in the neighbourhood of the woods and are said to inflict much damage by rooting up the adjacent plantations. From the point of view of geographical zoology the presence of a wild hog on the soil of Madagascar comes somewhat unexpectedly, because the original home of these animals seems to have been further north, at a time when the island was already cut loose from the continent. We may suppose, considering the half-aquatic habits of the river hogs, that immigration took place by water. The same holds also in the case of the hippopotamus, which once inhabited Madagascar, but has long been extinct. Grandidier discovered the remains of a small species (*Hippopotamus Lemerlii*) in the south-west in alluvial deposits. Since then the Rev.

Mr. Rosaas has unearthed hippopotamus remains in Antsirabe as well as in the Central part of Madagascar. These are ascribed to a second species (*H. madagascariensis*).

The domestic animals introduced by man will be treated of in another place.

On the whole the mammalia are represented by harmless



Madagascar Tenrec (*Centetes*).

and small creatures, there being no animals of an imposing or dangerous character.

The feathered world has many more forms. Even if it is inferior in brilliancy of colouring to that of the neighbouring continent, it contains many noteworthy species. Hartlaub and Grandidier have treated the ornithology of the island in great detail.

Of diurnal birds of prey the fish eagle (*Haliastur vociferoides*) is tolerably frequent and obviously approaches

the African form. Falcons, kites, and hawks are represented by species peculiar to the island (*Falco zoniventris*, *Circus Maillardi*, *Nisus Lantzii*); the nocturnal owls are of course regarded by the superstitious Malagasy as ominous of death; our barn owl has also become domiciled here. Among the eared owls there is to be reckoned *Otus madagascariensis*, among screech-owls *Noctua Polleni* and a dwarf owl (*Scops manadensis*).

The cuckoos are represented by some dozen species, which enliven the lonely wood with their incessant cry. They are solitary birds, they fly somewhat clumsily and pursue the insects and slugs, sometimes also ruthlessly plundering the nests of other birds. The genus *Coua*, of numerous species, is peculiar to this region. Five species on the eastern and seven on the western side are known. The characteristic bird of the east side is the sky-blue *Coua cœrulea*.

The parrots are neither numerous nor remarkable for beauty of plumage. *Coracopsis obscura* and the somewhat smaller *C. nigra* sometimes do injury to the rice-fields. They are of a suspicious nature and when pursued quickly betake themselves to the highest trees.

Of late years a small and elegant parrot has made its way to the markets of Europe; this is the greyheaded *Psittacula madagascariensis*, which is often met with in enormous flocks among the raphia forests. It is sought after for its flesh, being very good eating.

Of swallows there are known the martins and the esculent swallows, which build their nests among the rocks; one of the two species of goatsucker closely resembles our European species.

The screamers are represented by the peculiar genera *Eurystomus*, *Leptosomus* and *Brachypteracias*.

Beside the streams in the forest we meet with the kingfisher (*Alcedo cristata*), distinguished by its long crest of feathers; a second species (*Ipsidina madagascariensis*)

orange red above and white beneath, has hitherto only been seen in the moist ravines of the eastern side. Along the rivers the noisy bee-eater (*Merops superciliosus*) poises itself in the air; it is called ziri-ziri by the Malagasy, from its cry.

The honey-eaters (*Nectarinia Souimanga* and *N. notata*) resembling our creepers, climb about among the trees; their plumage shines with a metallic lustre.

Larger and smaller singing birds appear in numerous genera, chiefly endemic. The white-breasted crow (*Corvus scapularis*) is among the denizens of the coast villages, as it is in Africa; *Euryceros Prevostii* is black with a rusty red back. The Ourouvang (*Hypsipetes ourouvang*), of the size of a blackbird, hops among the underwood, as well as the melancholy *Dicrurus forficatus*. The gregarious fly-catchers (*Terpsiphone mutata*) present a very pleasing appearance. The bird is of the size of a finch; it is of a shiny black with long white feathers in the tail.

Thrushes, weaver-birds (*Ploceus pensilis* and *P. madagascariensis*), finches and larks (*Alauda hova*) are often seen in the interior.

A beautiful green dove (*Vinago australis*) with blue eyes is frequently met with. It is difficult to detect among the bamboo groves because its plumage harmonises so exactly with the soft green of the bamboo leaves.

Fumungus madagascariensis is black with dark-red tail. It is a solitary bird, living in the primeval forest.

The gallinaceæ are not largely represented. In the native market we sometimes get partridges (*Margaroperdix striata*) the male of which is spotted with white, and pretty quails (*Turnix nigricollis*).

The numerous moors, swamps and pools in the coast belt harbour many species of marsh fowl and waterfowl. The pretty sultana (*Porphyrio smaragnotus*), with its sea-

blue colouring and with green opalescence on the back, is an inhabitant of the moor, as is also *P. Alleni*.

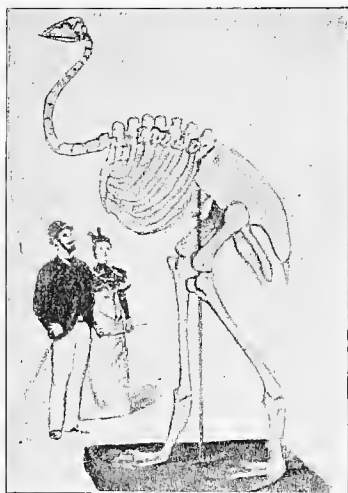
Flocks of white ox-peckers (*Buphaga africana*) intrude themselves where the cattle are pastured, as they do in East Africa. Ibises and rails inhabit the lakes. Of the Natatores of Madagascar we know *Nettion auritus*, *Sarcidiornis melanotus*, *Anas Melleri*, the tree-goose (*Dendrocygna arcuata*) and a grebe (*Podiceps Pelzeli*).

The discussion of the feathered inhabitants of the island cannot be concluded without referring to the recently extinct species, which have a high scientific interest. As the discoveries made not long since prove unmistakably, the region of Madagascar possessed an uncommonly rich and peculiar fauna in its Cursores, whose remains have been gathered in the surface alluvium of the west as well as in the swamp deposits of Central Madagascar. The first specimen discovered dates from the year 1851, and was exhibited at the Paris Academy, on the 27th of January of that year, by the French zoologist J. Geoffrey St. Hilaire. This was a gigantic egg, brought to Europe by Abadie, the captain of a trading vessel. Its major diameter was 12 inches and its capacity nearly two gallons, six times that of an ostrich's egg. This egg, of which many perfect specimens have since been obtained, was ascribed to a gigantic bird *Æpyornis maximus*. There was much discussion as to the position of this enormous bird, the Italian Bianconi thinking it to be a vulture, and that it must have been identical with the *roc* of the Venetian Marco Polo. In the year 1867 Grandidier succeeded in finding remains of bones in the west, and among these was a heavy shin bone, 25 inches in length, from which it was clear that we had to do with a large bird of the ostrich kind. Besides this two smaller species were found (*Æpyornis medius* and *Æ. modestus*).

At a later time M. G. Müller dug up further remains in Antsirabe, about 25 miles south of Antananarivo, but

unfortunately he was murdered by the natives. The Rev. Mr. Rosaas continued his investigations, so that not long ago Dr. Forsyth Major was able to bring to Europe some 1500 osteological remains.

To the three above-named species *Aepyornis Hildebrandti* and *Æ. ingens* can now be added; the last species considerably surpassing even *Æ. maximus* in size. Besides these, several species of cursors of more slender



Giant Ostrich of Madagascar (*Aepyornis ingens*).
(From the Revue des Sciences.)

build are known, closely related to the Indian cassowary and the New Zealand species of *Diornis*, and these were formed by Milne Edwards into a special genus, *Müllerornis*.

Not a single species of these ostrich-like land birds exists at present, but the nature of the deposits where their remains were found permits the conclusion that they were still alive in recent times. If we keep before our eyes the analogous phenomena in the Mascarene islands, which

are historically verified, the presumption seems probable that the extinction of these gigantic but perhaps somewhat unwieldy birds is connected with the appearance of Man, and that the earliest immigrants from Africa used them for food in every possible way, and sought out their eggs for the same purpose. I was surprised to find that in many places, possibly kitchen middens, *Æpyornis* bones were so numerous that a Creole was able to collect for me a whole chest full. This was in the Western part of the island.

The Reptilia, the only class which has any really dangerous animals, include numerous crocodiles, which are found in nearly all the rivers. An endeavour has been made to raise them into a separate species (*Crocodilis madagascariensis*, but they are obviously only a local variety of the ordinary Nilotic crocodile.

The lizards are represented by the nimble and useful geckoes, which often come into the houses to catch insects. Species of skink and gongylus are very common in the coast region, but the family most numerously represented is that of the chameleons, which must have had its central point in Madagascar, or perhaps in its neighbourhood. Side by side with species three feet in length there are forms which are truly dwarfish. Böttger, so early as 1877, had named no less than sixteen species, among which the most splendid in colour is *Chamæleo pardalis*. The snakes are harmless. A magnificent species (*Heterodon madagascariensis*) may be observed with extraordinary frequency under stones. Gigantic snakes too are not wanting; they are represented by two genera (*Pelophilus* and *Xiphosoma*), but are little feared by the natives. *Psammophis* is widely distributed in sandy soils. The tree-snakes have unique representatives in *Langaha nasuta* and *L. crista galli*. Of the *Chelonia* *Testudo radiata* may be mentioned, as well as *T. pardalis*, as exclusively dwelling on the land. The box-tortoise

(*Pyxis arachnoides*) is remarkable from its having the divisions of the carapace movable. The East African *Pelomedusa galeata* is classed with the fresh-water turtles.

The Amphibia are poor on the whole. There is indeed a dark-red frog, probably peculiar to the island (*Dyscophus Guineti*), but it is rare. *Rana Delalandi*, indigenous everywhere in tropical Africa, gets as far as the belt of forest; the Mascarene frog is yet more common. A small tree-frog (*Rhacophorus*) climbs about on the screw palms and may be seen in the morning sitting on the dagger-like leaves, but quickly makes its way back to the base of the leaf if any attempt is made to catch it.

The freshwater fish chiefly belong to the chromidæ so distinctive of Africa. Sibree remarks that eels of magnificent size are found in the interior. Small species, caught in the swamps by the Malagasy women, by means of a plaited bamboo net, are regularly brought to market in Tamatave.

The Invertebrata have not yet been fully investigated, but up to the present time have presented to us many remarkable phenomena.

The class Insecta is rich in splendidly coloured forms, distributed among almost all the orders. Of the family of ground beetles the genus *Homalosoma* deserves mention. Gadflies of the genus *Polybothris* are widely distributed as well as cetonidæ and large lucanidæ. *Lithinus Hildebrandti* among true beetles is known as one of the finest examples of protective resemblance, or mimicry; its resemblance in colour to a greyish white lichen being so deceptive that when it remains at rest it is almost invariably overlooked. Magnificent cerambycidæ gnaw into the trunks of the trees, in the larva stage; coccinellidæ are common. The glow-worms (*Luciola*) make a splendid show in warm evenings, swarming about the bushes and giving out their bright yellow light at regular intervals. The Hymenoptera have now been worked out with tolerable completeness. In

the coast region *Xylocopa astuans* swarms round the blossoms on the bushes. The gregarious wasps sting in an irritating manner, the sulphur-coloured *Polistes hebraea* is easily recognized by its sluggish flight. The honey bee is represented by the dark African variety (*Apis mellifica*, var. *fasciata*) and supplies honey and wax to the natives. The wax is becoming an article of export. The number of ants is very great; they have recently



Actias cometas.

been described in an excellent manner by A. Forel. The most numerous genus, *Camponotus*, has over thirty species in Madagascar. Two species of leaping ants, *Odondomachus hamatodes* and *Anochetus africanus*, are found in the trunks of dead screw-pines; these are able to make a spring of from four to five inches by alternately extending their jaws and rapidly bringing them together. The wiziga (*Cremastogaster Ranavalonis* Forel) has a bad name for ferocity among the natives. It con-

structs large black nests in the woods. In the economy of Nature it plays an important part, as it aids in the formation of soil by reducing to pulp the fallen trunks of palms and barringtonias as well as of other trees. This useful work, which is rapidly performed, is shared in by other species, especially *C. tricolor*, *C. maculatus*, *C. Grandidieri* and *C. Kelleri*. Among the Lepidoptera there are a few which are greatly sought on account of their beauty, e.g., *Arania riphæus*, of a brilliant green and gold, and a large spinning moth (*Actias cometas*) with wings extending 8 inches across and drawn out behind to a great length. The butterflies are represented by various species of *Acræa*, *Salamis* and *Diadema*. *Papilio demoleus* is somewhat common. *Plaucopis formosa*, a species found also in East Africa, with brilliant colours and a heavy body, flies beside the rivers. Special mention must be made of the Madagascar silk-worm (*Bombyx Radama*).

Gryllidæ and large woodlice are very troublesome, and gnats are a veritable plague; they are especially numerous on the Sakalava coast, where they often make the nights quite unendurable. In moorland districts there are swarms of dragon-flies; the termites are chiefly confined to the forest region, but it seems that they are also found on the southern steppes.

Of the Hemiptera I should like to mention the red and yellow *Plataspis coccinelloides*, distinguished by its enormous shield. It is gregarious, covering long branches of the trees on which it lives.

The Madagascar spiders have become better known by the investigations of Dr. Vinson. There is a surprising number of wheel-web spinners, whose strong nets are met with everywhere in the neighbourhood of the dwellings, on the shores of the streams and in the clearings of the forest. *Epeira livida* generally takes up its abode under the roofs of the houses, *Epeira mauritia* hunts

after insects on the grass plots. It is one of the most beautiful creatures of the island, with the shining rings of gold and silver that enclose its abdomen. *Gasteracantha madagascariensis* is a characteristic form in the woodlands. *Latrodectus menavody*, a species of depressed shape, its abdomen black with blood-red spots, lives under stones. The Malagasy fear it as being poisonous, but I have always found this spider quite harmless.

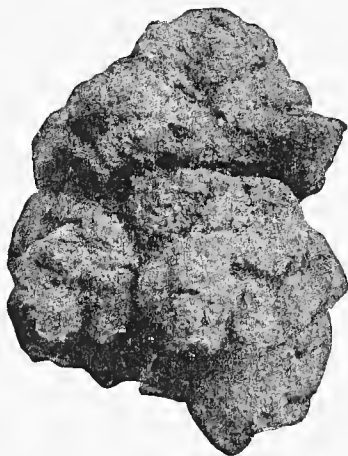
Gally-worms (*Iulus corallinus*) and mordacious centipedes are frequent, and also a gigantic woodlouse, *Zephronia hippocastaneum*, which rolls itself into a ball on the approach of danger.

The standing waters are not poor in Crustacea; small water-fleas and sand-hoppers can be caught in shoals. These have yet to be more closely investigated. A magnificent crayfish (*Astacus madagascariensis*) lives in the waters of Central Madagascar.

The Mollusca are by no means poor in species. In the brackish pools live species of potamidæ which are relished by the natives; black melaniæ and ampullariæ inhabit the brooks and rivers, while in the interior marsh univalves (*Limnæa hovarum* and *electa*) are not wanting. The family of land-snails contains large slugs, gigantic cyclostomes, and some peculiar species of helix (*H. Cornu-giganticum*, *H. Cowanii*, *H. betsileonensis*). *Agathina* is quite common near the coast, especially on the screw palm.

In conclusion we must bestow a few words on the Annelida. In damp places on the coast there live under stones numerous land nemertines, sometimes splendidly coloured, which have obviously adapted themselves to a terrestrial life straight from their marine habitat, without an intermediate life in fresh water. In the forest there are numbers of black terrestrial leeches an inch in length, which molest human beings, and on every excursion I was able to collect a great number upon my bearers, in the act of biting their way into the skin.

The earthworms of the island are specially remarkable. Of the smaller species *Pontoscolex corethaurus* and *Perichæta biserialis* occur the most frequently. A truly gigantic species was discovered by me in 1886 (*Kynotus Darwinii*). I possess several specimens of the thickness of the finger and a yard and a half in length. In the formation of mould and preparation of the soil they take a pre-eminent share, for they make deep passages in the ground and thus contribute to the airing and breaking



Excrement of the earthworm (*Kynotus Darwinii*)
(greatly reduced).

up of the surface mould. These gigantic annelida, after the fashion of our earthworms at home, pass a mass of earth through their intestines to cast it up afterwards on the surface; masses of these lumps of excrement lie about in many places. When dry they weigh on an average from $4\frac{1}{2}$ to 5 ounces, and some specimens attain the weight of from 6 to $6\frac{1}{2}$ ounces. The disturbance of soil must thus be very considerable, and it is calculated that these animals are able in the course of 50 years to supply to the surface a stratum three feet in thickness.

CHAPTER VI

POPULATION

SMALL as is the distance of the great island from the neighbouring continent, its population bears a markedly different stamp from that of Africa, and seems to be absolutely unique. In this wonderful mixture of peoples there is absolutely no unity of character. We meet with the greatest contrasts, not only in respect to the general morphological condition of the inhabitants, and the colour of their skin, but also with regard to their intellectual culture, their material well-being, their customs and their political institutions. While on the one side we are surprised by the open hospitality and amiability of many tribes, we meet in turn with rudeness and repellant behaviour among others. Here we are charmed by the cleanliness and domestic comfort in the villages, there we find brutalised forms of indescribable filth. In many districts we find the greatest sobriety and austerity, in others prevail licentious manners and moral degradation, to which it is difficult to find a parallel. These contrasts explain the contradictory and often one-sided accounts of travellers concerning the people of Madagascar.

The origin and anthropological position of the several tribes have long formed the subject of lively discussion. Yet the matter is comparatively simple, so long as we do not allow ourselves to be influenced by linguistic methods, but confine ourselves to morphological facts.

The geographical position of the island suggests an African immigration for the Malagasy, and the Englishman Crawford actually went so far as to look upon the

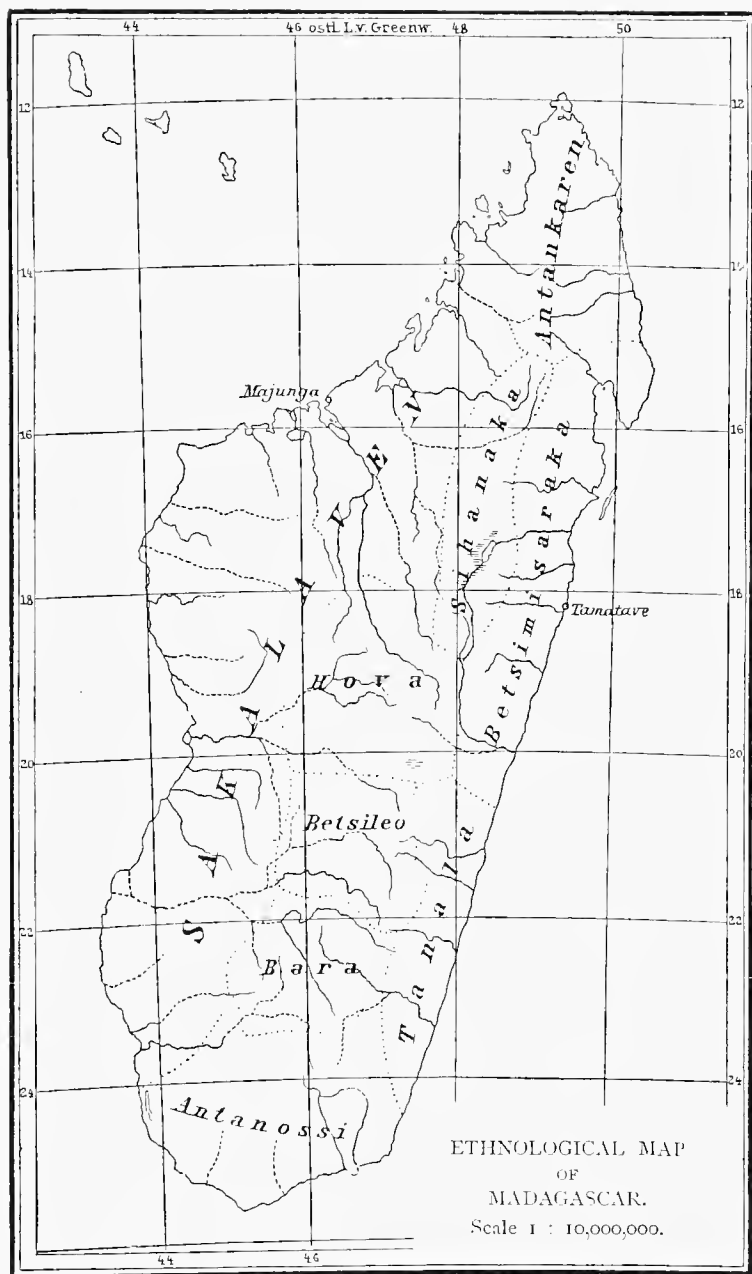
Malayan immigration as quite subordinate, and to describe the Malagasy as genuine negroes of African kinship. In this he certainly goes too far. J. Sibree, in other respects an excellent observer, fell into the opposite error in laying excessive stress on the Malayan character and allowing the African, Arabian and Indian elements to appear as only quite subordinate to the Malayan immigration from the East.

Apparently he has allowed himself to be too much led away by linguistic considerations. It is indeed true that a uniform indubitable Malayan language is in use throughout the whole island, but this has been simply imposed by force on the part of the Hova population, for, owing to the nomadic life of the Malagasy and the ascendancy of the Hova, a knowledge of this language appeared to be a necessity. Moreover, many dialects still exist in Madagascar, which differ greatly from the Hova language, but have not yet been sufficiently examined in detail. It is surprising how easily the western tribes make themselves understood to Makoa and Swali people who come to the country.

That the feeling of a common origin does not exist among the people themselves, is evident from the circumstance, which I have often observed, that the nations make a sharp distinction between 'Hova' and 'Malgash'; the latter appellation embracing all non-Malayan and thus negro-like elements.

The assumption of James Cameron is entirely without foundation. He draws a parallel between the Hova and the Jews of the time of Solomon, and finds so great a resemblance in certain customs that he tries to render probable a Semitic immigration in Phœnician ships. If we except the intermixture of Malagasy and Arabs, which must have been mainly confined to the west of the island, Semitic traces are entirely wanting.

In 1886 Alfred Grandidier formed what seems to be



the most correct estimate of the origin of the Malagasy tribes, and I myself, at the same time and independently of him, came to a similar conclusion. This eminent French traveller treats the Malagasy as a mixture of two elements, ethnographically and anthropologically entirely distinct, the one embracing the Hova settled in the central province and on isolated points on the coast, and the other made up of the tribes which inhabit the rest of the periphery of the island.

Grandidier regards the Hova and them only as genuine Malays, who have made their way into the country from Java or a region near to it. The negroid elements, according to him, point to the district of Indo-China in their customs and religious conceptions. In this latter point I am obliged to differ from him, as I hold the second element, so far as it has remained without admixture, to be of genuine African origin. We have obviously to do with negro tribes which have come from South East Africa. As soon as we leave the east coast and enter the district of the Sakalava on the west the African stamp of the population becomes unmistakable.

As to when the first settlement of Madagascar took place we have no kind of historical data, and the traditions of the people give us no distinct indication as to the time of arrival either of the negroes or of the Hova. Opinions are still divided on the question whether the Hova were before or after the African population, but Ratzel may very likely be right in thinking that the influx of Asiatic peoples took place over a stratum of already existing African peoples.

Mention is often made in literature of an aboriginal population, which existed before the Malayan immigration. In the central province, now inhabited by the Hova, there are found various stone heaps of irregular form, which are looked upon as the burial places of an

earlier people called Vazimba, and honoured with religious awe. The Vazimba were small; they were ignorant of the use of iron, and must have used spears differing from those of the Hova. A remnant of this people is said still to exist in West Madagascar.

Earlier French travellers, such as Flacourt and the botanist Commerson, mentioned the Kimos, a dwarfish race with bright coloured skin and long arms, which was said to live in the southern part of the island. The Count de Modarve, who was governor of Fort Dauphin from 1768 to 1770, describes a woman whose height was little more than three feet.

Dwarfish individuals have given rise to fanciful opinions among all nations, and the Malagasy are much given to romancing, so that the existence of an autochthonous race of dwarfs is only to be accepted with caution, and the fact does not appear exceedingly probable, for it is difficult to suppose that tribes of Bushmen have made their way here from the continent; possibly we have to do with a degenerate negro tribe.

The first immigration of negro peoples from Africa probably took place from the East African coast, for the Mozambique Channel offers no insuperable difficulties even for vessels of primitive construction. The Malay element appeared far later, and even to the time of Flacourt seems to have played a by no means prominent part.

It must be considered as an important fact for arriving at a true conclusion about the conditions of this immigration, that the domestic cattle of Madagascar undoubtedly come from the African continent, and are to be considered as belonging to the East African Sanga race.

I have put forward a hypothesis which is perhaps not to be entirely rejected, that the general settlement by African peoples did not take place till about a thousand years ago. This supposition is based on the following

considerations. When man makes his first appearance in new districts, especially districts of an insular character, he frequently brings about important changes in the fauna. Now it is in the highest degree noteworthy that Madagascar was inhabited by some dozen species of flightless ostrich-like birds, which cannot have been extinct for any very considerable period, for their remains have been met with, sometimes in great quantity, in alluvial deposits. They belong to the genera *Æpyornis* and *Müllerornis*, and the size of several species must have been enormous, to judge from the dimensions of the bones as well as the remains of the eggs. No one indeed but man can have brought about the destruction of these gigantic birds, as the larger carnivora are wanting in the island. At the time of Marco Polo these mighty birds are said to have been still living, or at any rate the remembrance of their existence was still vivid, whereas it has now entirely passed away. In Marco Polo's time then, the island was inhabited, but had been so only for a few centuries, not sufficient for the complete extirpation of these birds. This, as I have said, is only hypothetical.

a. MALAYAN TRIBES. These chiefly inhabit the central highlands, but isolated colonies live on the sea coast as well, especially in the east. At the head we place the Hova, who are intellectually above all the other Malagasy. They have taken the lead in adopting European culture. In the central province of Imerina their number is estimated at about a million souls. The Hova have retained the Malayan character in the greatest purity. The men are of middle height, but strongly built; the shape of the head is pronouncedly brachycephalous; the prominent forehead is finely rounded; the dark brown eyes are not exactly large, but are somewhat deep set. The nose is, as a rule, straight and blunt, but at times it is strongly prominent and aquiline. The mouth is not small, as a

rule, but the lips are regular, at any rate they do not protrude like those of the negro; the chin is generally round.

The hair is not especially luxuriant, the beard is sparse, the hair of the head black, either straight or curly, but never actually woolly. The trunk appears relatively short, the chest is frequently strongly developed. The colour of the skin is subject to much variation, individuals of dark colour being found side by side with fair ones.

Striking touches of European physiognomy are found among the men, while among the women the character of the Malayan race is more strongly pronounced, and in many cases there is even a decided obliquity in the position of the eyes, which gives to the Hova women a certain resemblance to the Chinese. Without being exactly beautiful they present to us interesting, lithe and graceful forms, and treat their European guests with much grace. In later life they frequently incline to obesity.

The well-to-do Hova have adopted European costume for both sexes, and it is only the poor who dress in Malagasy fashion, that is with a simple loin-cloth and a rude jacket of palm leaves, over which a cotton overall (lamba) is thrown as a protection against cold and rain.

Reports as to the character of the Hova are extraordinarily contradictory, but must be received with caution, as their country has been much infested by European adventurers, and the Hova have thus been made very suspicious of foreigners. Alfred Grandidier, a thoroughly trustworthy inquirer, draws the following picture of their character, a perfectly accurate one according to my own experience: "The people are of a suspicious temper, but they are worthy of our attention. The Hova are temperate, and persevering in their work. They have an innate feeling of reverence for their superiors, are very amenable to discipline, and are absolutely devoted



Hova Women.
(From a Photograph by Dr. A. Voltzkow.)

To face p. 64.

to their chiefs. Their patriotism is sincere". I can add to this that they are capable of real enthusiasm for higher ideas. When they are properly treated a genuine faithfulness displays itself; hospitality is liberal and is everywhere practised. Though in early times they gave many examples of cruelty, the introduction of European culture has brought about a great improvement. It is important in all future attempts at colonization to secure the Hova element, and make their good qualities serviceable.

The Betsileo, whose number is estimated at 1,200,000 souls, must also be reckoned as part of the Malay element. Their home is the mountainous plateau to the south of the province of Imerina. According to the description given in the Antananarivo Annual by G. A. Shaw, the Betsileo tribes have a good deal of admixture of foreign blood. The colour of the skin is uniformly darker, the nose flatter and the lips more prominent than among the Hova. The beard is scanty or wanting, and such beard as does exist is removed by art. Their frame and muscles are powerful, their appearance physically is an excellent one, and their moral qualities are said to stand tolerably high. The stately height of six feet is attributed to the men, and the women are but little shorter.

Split up in former times into various tribes, and relying absolutely upon their chiefs, they distinguished themselves by their valour, but had nevertheless to submit to the rule of the Hova. All reports agree that they manage their soil like skilful husbandmen and that they are rich in cattle. The attachment of the Betsileo to their families and their strong feeling of tribal unity are renowned; but their weak side is a quarrelsome nature and a tendency to positiveness and superstition.

b. AFRICAN TRIBES. The Malagasy of negro type, as has been said, inhabit the coast land of the island. The negro blood is to be found in its purest form among

the Sakalava, under which name is included some half million of the inhabitants of the west coast. Their home embraces wide plains as well as undulating hilly country,



Kanusiky-Sakalava, of Morondova.
(From a Photograph by Dr A. Völtzkow.)

and its steppe-like character is far better adapted for raising cattle than for agriculture. Their mode of life consequently approaches that of nomads, and is far less settled than among the Hova.

The Sakalava are an interesting people, and having

remained tolerably free from the evil influence of the European and Creole elements, they form a handsome and powerful race of men, of attractive exterior.

The colour is invariably very dark, both among men and women, the shiny skin is of a delicate texture, the hair quite woolly, as among the genuine negroes. The men are over middle height, of powerful build and with strong chests, but on the whole somewhat slender.



Sakalava Woman.

The mesocephalic head has a prominent forehead, the beardless face ends in a somewhat pointed chin and possesses an intelligent, and frequently a refined, expression. The cheek-bones are very prominent, as are also the orbital arches, so that the eyes lie somewhat deep in the head. The large mouth is surrounded by protruding lips. The nose, frequently very prominent, appears broad from its wide nostrils. The assertion that the teeth have an oblique position is one that I am not

able to confirm. The bearing of the men is proud and self-reliant.

The Sakalava women are tall and of plastic shapes; the beautiful, bright and expressive eyes, the animated features, the luxuriant hair, arranged with great pains, lend a noble aspect to their forms; their feet and hands especially are often of aristocratic delicacy. The flat nose, depressed at the base, is their only disfigurement. The cheerful, and on the whole good-natured, character of the Sakalava women, is very attractive. This favourable opinion is increased by their tasteful and picturesque dress and by their cleanliness, which frequently extends to the interior of their houses.

The character of the Sakalava as a people has not been represented entirely in a favourable light. A. Walen, who lived among the southern Sakalava for a considerable time, describes them as arrogant, cunning, violent and thievish. In the last campaign of the French against the Hova they shewed themselves by no means entirely trustworthy, for they frequently stole back again during the night the cattle they had sold to the troops in the day.

The Sakalava of the coast, extraordinarily venturesome on the sea, were at one time the most dreaded of pirates; they rendered the Mozambique Channel insecure and did a good deal of damage, especially to the Portuguese. Being warlike tribes, truly devoted to their kings, they held at one time the chief influence in the island, but at the beginning of this century they were brought under the yoke of the Hova. They have always endured this position with reluctance and they hate the Malayan element.

The northern Sakalava are decidedly more civilised and more agreeable than their racial allies in the south, but they too are shy of work, they are unfitted for employment on plantations, and are given to a nomadic life. The men endeavour as far as possible to hand over all



Sakalava Women.
(From a Photograph by Dr. A. Voltzkow.)

To face p. 68.

labour to the good-natured women and to make their own life as pleasant as possible.

Quite in the north, around the bay of Diego Suarez, live the Antankara, who on account of the unproductiveness of the soil are driven to fishing and cattle-raising. They are closely related to the Sakalava, but must have received a good deal of Arab blood. They are of great height, and the remarkable size of body of some of the



Bara (from the *Revue des Sciences*).

women is striking. They have always evinced much sympathy for the European element and are more to be trusted than the Sakalava.

More to the south, principally in the neighbourhood of the Lake Alaotra, lives a lake people, the Sihanaka. Their country consists partly of extensive swamps, partly of undulating plains; it is considered very unhealthy. According to the as yet very incomplete accounts, the Sihanaka appear to be a mixed people closely connected in character with the negro tribes of the east coast, but

with a strong admixture of a Hova element from Imerina. Their colour is described as being tolerably fair. While much given to drinking, and of a superstitious and silly nature, they are said to practise hospitality. Their chief business consists of fishing, rice culture, and cattle-raising. Their wealth in cattle is worthy of remark, well-to-do individuals often possessing from 1000 to 5000 head.

Quite in the south of the central plateau dwell the Bara, apparently a degenerate Sakalava people, in whom the African peculiarities stand out unmixed. Their woolly hair is matted together in a number of tight knots with grease, wax and chalk, giving them a very strange appearance. By all accounts the people are represented as being rude, inhospitable, and extremely immoral. Certain tribes live in perpetual feud with one another. Robbery and theft are the order of the day. Even the Hova have not mastered the Bara.

If we turn to the east coast we find the tribes of the Betsimisaraka far the most populous; their number is estimated at 800,000 souls. Their habitat extends to the forest girdle, reaching in the north as far as the Bay of Antongil, and in the south to about the 20th parallel of latitude. It is stated that the Betsimisaraka are akin to the Hova, but this statement cannot be in any way accepted. The colour indeed is strikingly fair, generally a light sepia brown, but, in spite of this, we have to do in this case, in so far as it has been subject to no admixture, with a genuine negro people. The woolly hair, the prominent cheek-bones, the flat and frequently depressed nose, and not least, the specific smell of the perspiration from the skin, point undoubtedly to an African origin.

Originally the Betsimisaraka were a powerful people, and were still flourishing in Flacourt's time, but at present strong marks of degeneracy may be recognized. Among the men are to be found isolated types of tall power-

ful build and beautiful regularity of body, but in all we are struck by the abnormally long trunk. The countenance exhibits a scanty beard and ends in a sharp chin.

The women are small and active, but often ugly. The shape is angular, the neck immoderately long, the forehead low and the cheek-bones strongly prominent. The woolly hair is separated into quadrangular portions and twisted into knots, four on the top of the head and six or eight at the back.

Their character was not a bad one originally, but contact with the often dubious Creole elements of the neighbouring islands of Réunion and Mauritius has degraded the people; the brandy plague especially has taken a strong hold of them, so that in many of the coast villages a truly besotted mode of life prevails. For European undertakings it would be an advantage if what there is yet to be preserved of this once able people were saved as soon as possible. Hospitality is largely practised by these tribes and they hold Europeans in high esteem.

The Tanala inhabit the wooded region in the south-east, to the east of Betsileo-land. Their features are regular and there is possibly a considerable admixture of Hova blood. Their intellectual endowments are not high.

The Antanossi, dwelling in the district about Fort Dauphin, are said to constitute a mixed race and their hair is described as curly; perhaps the admixture of Arabic blood is not inconsiderable.

Besides the peoples named, some few groups of Asiatic settlers play a certain part in Madagascar. The influx of Arabs must have been not unimportant in former times, as specimens of Arabic writing were still to be found in Flacourt's time. At present the Arabic element has withdrawn to the Sakalava coast. Indian traders not only live at almost all the places on the coast, but even make their way to the interior. Of late also the inevitable Chinese have appeared on the soil of Madagascar.

The total population of Madagascar can be only approximately estimated, as no accurate census has been undertaken, even in the best known province, that of the Hova; Grandidier puts it at five millions. This may be too high an estimate, for wide districts are very sparsely peopled. The population is densest in the province of Imerina, and next to that in the highly cultivated Betsileo-land. The natural resources of the island are so great that the number of inhabitants might easily be multiplied tenfold without incommoding the existing tribes in any way. The small fecundity of so many Malagasy women, joined to the custom of infanticide, formerly very common, has hindered the increase of the population.

Any description of the collective life of the Malagasy must necessarily remain imperfect through our scanty knowledge of many tribes. From the various descent of the Malagasy peoples it is absurd to talk of a uniform stamp. This diversity is least apparent in the case of language, for though, as we have seen, markedly different dialects occur, yet the Malayan speech of the Hova, the most talented tribe of the island, is in use everywhere. In this language the vowels are multiplied to such a degree that it is a real pleasure to hear a Malagasy speak. Owing to the oratorical gifts of the people the opportunity of listening to the "Italian of the Southern Hemisphere" and of admiring its musical charm presents itself often enough. This euphony, together with the simplicity of the grammar and the absence of inflexions, has obviously facilitated its general extension over the island. Originally there was no special writing in use, but the Latin alphabet has been introduced by the English missionaries, and printed matter in Antananarivo always appears in Roman characters.

The Hova language, as we conclude from the number of obsolete words, seems to have altered a good deal in the course of centuries; if it is poorer in



Tanala Girl.
(From the *Revue des Sciences*.)

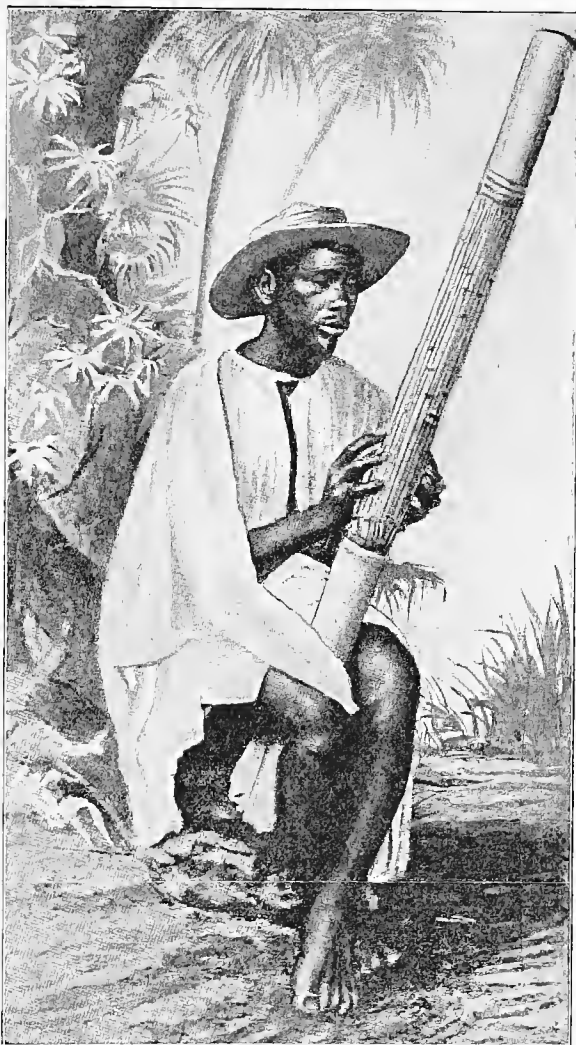
To face p. 72.

certain directions, it has been enriched on the other hand by the introduction and assimilation of foreign elements, so that much has been admitted from Arabic, French and English. The names of the days and the months are of Arabic origin, those words which indicate articles imported from Europe are French, while words denoting articles used for house building, pedagogical and ecclesiastical terms are of English derivation. The names of domestic animals and of useful plants also spring from a foreign source. It is not without interest to notice that the humped cattle, which in many places form the wealth of the inhabitants, are called "ombe". This expression comes from the Swali word "ngombe" which means *ox*. Thus the cattle of Madagascar have certainly been introduced from East Africa, and this is confirmed by my own anatomical examination of the construction of the skull; they belong to the Sanga breed, which is found as far as Abyssinia. In geographical names it is sometimes difficult to recognize the derivation from European languages. Thus the coast town Tamatave is called "Toamosina," a corruption of the Portuguese name San Tomaso, and Fort Dauphin is called by the Malagasy "Faradofay". With language is closely connected the art of singing, to which nearly all the tribes are passionately given, in accordance with their lively and cheerful disposition. Every festive occasion, whether of a joyous or mournful nature, is accompanied with singing and music. If we go on the water, the boatmen accompany the stroke of the oars with their soft sailor songs, ceasing when perhaps a crocodile comes suspiciously near to the craft. If we rest from the labours of the day in a Malagasy village a concert is got up for the entertainment of the stranger. If a person of consequence dies, musicians surround the house of mourning, followed by men and women, while the relations within are dissolved in tears. Among the Sakalava a monochord is used, drums

are applied for giving an alarm, and the tones of the concertina are heard in almost all the villages. The Hova play the violin with great skill; within the last ten years their trumpeters have composed a national hymn; one old princess had a granddaughter whom I heard play the piano really well. The valiha, or bamboo guitar, the tones of which make quite a pleasing impression on the ear, is used in many of the villages. This instrument consists of a piece of bamboo-cane some six feet long, the cavity of which serves as sounding board. Between the ends of an internode the strings are cut out of the tough rind with a sharp instrument and are then stretched by quadrangular bridges of the hard rind of *Brehmia spinosa*.

The costume of the Malagasy has lost much of its originality, especially among the Hova, who generally dress in European fashion. Among the Hova slaves and the African Malagasy the men wear a loin-cloth and a jacket of rough palm-cloth, over which is a woollen overall (lamba). Overalls of silk, for the most part very elaborately worked, are used even by the Hova who wear European dress. The women make use of a good-sized piece of palm-cloth, which is fastened over the hips and reaches to the ground, to serve as a gown, while a second wrapper is thrown round the shoulders. As head-gear the men in the Hova district have a cap or hat made of rice straw, the women array themselves in straw hats adorned with red ribbons; among the African tribes the head is generally uncovered, but occasionally caps of lambskin or ox-hide are made use of.

Among the Sakalava of the west, European dress has made some way, under the influence of the Jesuit mission in the north. Sakalava women of quality are even beginning to squeeze their feet into tight boots, but they move about in them with comical awkwardness. The men wear a loin-cloth, after the manner of the Muscat Arabs,



Betsimisaraka with Bamboo guitar (valiha).
(From the Revue des Sciences.)

a flannel jacket, and a quilted linen cap of dazzling whiteness.

The national costume of the Sakalava women is most picturesque, adapted as it is to their tropical surroundings; gown and outer garment (*sembu*) consist each of six seamless coloured handkerchiefs with large patterns in white and red, while the Betsimisaraka women prefer quiet colours, such as blue and green. The *lamba* is abhorred by all Sakalava, as it is used by the Hova.

The south-eastern tribes dress in a kind of skirt made of tree bark or reed matting, fastened over the hips, the upper part of the body remaining uncovered.

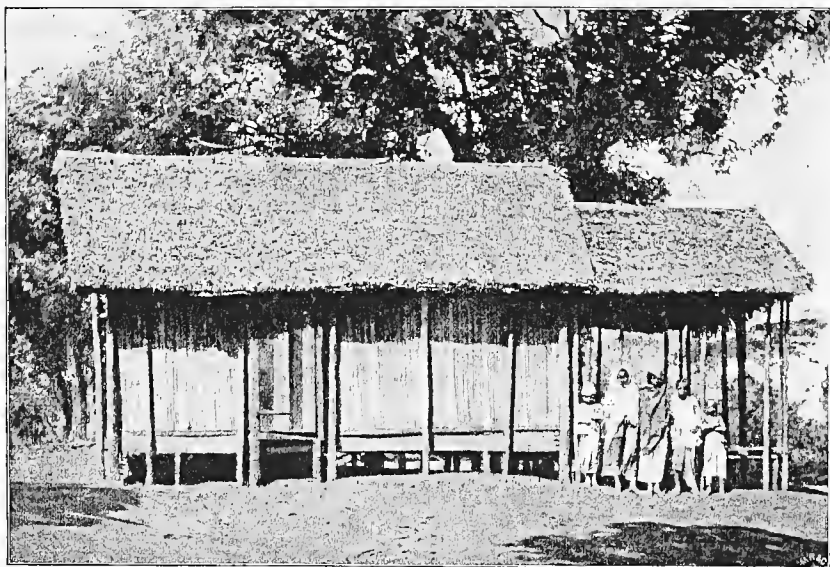
Ornament is much affected, especially by the black tribes. The Sakalava women adorn the neck with as many coral and bead necklaces as possible. If they can afford it they procure heavy chains of silver. Silver rings are set on fingers and toes, heavy amulets of precious metal are worn by every well-to-do woman, the ears are often adorned with five or six large rings, occasionally even the men wear earrings, and pegs are sometimes stuck through the sides of the nose. The poorer women content themselves with a large round piece of ebony which is forced into the lobe of the ear. Even the Tanala possess a considerable amount of ornament for head, neck and arms, while the Betsimisaraka women are for the most part very scantily provided in this respect. Tattooing occurs but seldom, and as yet it is only among the Betsileo women that isolated cases of graceful patterns on the neck and breast have been remarked. On the other hand, it occurs very frequently that the face is smeared with a white paste, either to make the skin fairer, or, as I have been assured, to impart a pleasant coolness to the body after too free indulgence in alcohol. The Hova and the Sakalava women delight in painting beauty spots on their faces, the former applying a black colour, and the latter, by way of opposition, using white

or red. The blacking of the eyelids with antimony as practised in the west has apparently been taken from the Arabs.

The weapons of the Malagasy were originally made in a very simple manner; we do not recognise in them, even remotely, the artistic skill that we meet with in many Malay tribes and even in African tribes. Bows and arrows are but little in use, but, on the other hand, spears and shields are diffused generally, and not long ago, even in the capital, the body-guard of Ranavalona III. was composed of spearmen. In hunting the smaller animals the inhabitants frequently make use of a long blow-pipe; for a long time past, however, European weapons have been largely introduced both among the Hova and the Sakalava, even cannon having been provided for the defence of the Hova army, but they were not able to offer an effective resistance to the advance of the French.

The dwelling-houses of the natives present differences of no small importance among the various races. The most marked contrast is that between the house of the Hova and that of the Sakalava. The former has clay walls; the ground plan has the shape of a rectangle half as long again as it is broad. The length always runs north and south. The entrance door and the open window are invariably on the western side. The roof, with its somewhat steep gable, rests on three high posts; grasses or reeds serve as material for roofing; at the ends of the gable stand the house-horns which are so characteristic of the Hova house. Well-to-do inhabitants often build wooden houses, the adjoining grounds being enclosed by a wall of clay. The equipment of the interior is usually very simple. To the left of the door is the hearth, the smoke from which passes out by the window or the roof. On the east, but not directly opposite, stand the water-pots, and in the north-east corner the bedstead. A rice mortar, half a dozen

horn spoons, some baskets and earthen dishes, rolled up mats and a couple of lances complete the furniture of the house. Among the Hova of rank a table is added, which is covered with a clean tablecloth for a guest; though this last may display a hole here and there. Among the Betsileo the houses are smaller than among the Hova, and the narrow entrance is often fixed at a



Sakalava House.

considerable distance above the floor.

The dwelling-house of the Sakalava has quite a different appearance. The better villages on the west coast are frequently situated most picturesquely in the shadow of the palms or mango trees. Among the northern Sakalava an exemplary cleanliness prevails both inside and outside of the house. These houses, which are fairly large, are true lacustrine dwellings built on wooden

stakes which allow the water during the tropical rains to pass under them to the depth of 20 inches. The roof is supported by several strong wooden poles. The panels of the house walls are formed of the bar-shaped, very tough mid-ribs of the raphia palm, as are also the palisades enclosing the space which usually surrounds the house. Windows are not introduced at all; the somewhat large entrance door, constructed of the same material, turns on two hinges of cord. When the owner goes out, a padlock is placed on the door or a staff is leant against it to indicate that the house is not to be entered. The roofs are less steep than in the Hova houses, and the gables are never adorned with house horns. The roofing consists of the leaves of the ravenala, which afford excellent protection against the rain. An open veranda is often built on to the house proper. In the courtyard, which is shut off by a tolerably high paling, stand the heavy wooden pestle and mortar for pounding rice. It is the business of the women to look after the rice pounding, which generally begins at ten o'clock in the morning and is resumed at two in the afternoon. The arrangement of the interior of the dwelling naturally depends on the pecuniary position of the owner, the well-to-do Sakalava fitting out their domestic arrangements in a tasteful manner which gave me much pleasure. Dwelling-rooms and sleeping-rooms are separated: the interior walls are hung with coloured cloths as is also the divan which is used for repose. Fans obtained from the Arab traders hang on the walls; cups, drinking-glasses, and porcelain vessels stand about, and they have a great fancy for collecting empty bottles. The women make a special point of storing up in the sleeping place as many pillows as possible. These are long and narrow and are covered with cotton or even with silk. In one house I counted no less than sixteen pillows one above another. Some looking-

glasses and often an accordion complete the furniture.

The house of the Betsimisaraka of the east is similar, but is on the whole on a much poorer scale. The door is opened and shut with cords. In the forest region, where the ravenala grows too high to be easily reached, the roofing consists of the stems and leaves of the langozy plant (amomum). Some long bamboo rods, used as water-vessels, generally stand to the left of the door; shorter pieces of bamboo serve as drinking-cups; opposite the door is the hearth with the iron cooking-pot. A few napkins of plaited rice-straw or reeds, a heap of fresh ravenala leaves on which the rice is eaten, and some rolls of mats, form the ordinary outfit of the house. On the wall there frequently hangs an elegant wicker tray made of raphia leaves, which can be placed on the knees. On this the ravenala leaves or the plaited napkins are spread to receive the repast, which consists of rice, meat or dried fish. The sleeping-room is separate; there is not always a bedstead, but it is replaced among the poor people by a wide sack, which is spread out on the ground and into which the family creep one by one. In the interior of the Betsimisaraka country there are a striking number of uninhabited houses, which serve for storing rice; these frequently stand on very high wooden stakes, or on a single wooden stem and are only entered by a ladder. This mode of construction is for the purpose of preventing the rats, which are found in East Madagascar in great numbers, from getting at the stores.

Let us turn to the family and social life of the Malagasy. The institution of marriage is attended with few formalities, in accordance with the slight inclination on the part of the people for a demonstrative display of feeling. Marriages with relations, that is to say with first cousins, frequently take place without noticeable evil consequences. Among the Hova the celebration takes

place in the house of the bride's parents. The young couple eat with the same spoon out of the same dish, then they are enfolded in a coloured lamba. In many places it is the custom for the bridegroom to tear the lamba to indicate that the bond of marriage is not indissoluble. The ceremony becomes legally valid after a sum of money has been handed to the parents of the bride. Among the Sakalava the wooer must first have given proof of his courage by taking part in warlike sports. As to chastity on the part of unmarried women, not a word can be said in general, and it is indicative of the morals of the inhabitants that their language has not any word for it. The intercourse of the sexes before marriage is very free, and this among many tribes leads to dissoluteness. The Bara especially are notorious for their licentious natures, and even the Hova do not stand quite in the odour of sanctity, even if they pay more regard to appearances.

The Sakalava whom I asked concerning the absence of restraint on the unmarried girls explained to me quite gravely that the system had its advantages, as one could form a timely judgment as to their conduct, and they draw a delicate distinction between immodest and reluctant girls. The fact that a girl has had a child forms no impediment to her marriage—on the contrary it increases the chance of her getting a husband. This circumstance becomes fully intelligible in a country where all the vices of civilisation have been disseminated by European adventurers, and where in consequence the infertility of marriage has taken considerable hold. Polygamy was formerly much practised, and is so to some extent even to the present day. The old Hova chiefs had a right to twelve legitimate wives. Since the spread of Christianity among the Hova circumstances have altered, but in many cases only in appearance. Things are less edifying among other tribes. It is recorded of one

Bara chieftain that he had some hundreds of wives. The position of the wife is relatively free and honourable; not seldom we find strong marks of family affection, and where Christianity has taken root, the inner life of the family has decidedly gained. The ruder kind of abuses, such, for instance, as the custom that the people should give themselves up to immoderate excess on the occasion of a birth in the royal family, have long ago been suppressed.

Divorce is easy, but among the Hova it has not been practised so frequently of late as it used to be. The fate of the divorced wife is a very hard one when remarriage has been forbidden to her by the husband. In that case there is handed to her at the time of the divorce:—first a black fowl to indicate that she is to be repellant to all men, then a staff to show that she must wander about without a home; a small piece of money expresses the fact that she is to be poor and dependent on alms. The fourth gift is a piece of white wadding expressing symbolically that she is to remain in this condition till her hair is white. Among the Sihanaka the widow is cruelly treated after her husband's death; she is overwhelmed with abuse, she is violently stripped of her ornaments and treated by everyone as an outlaw; after she has passed her hard year of mourning in this fashion and her husband's family have exonerated her from all guilt concerning his death, she is allowed to return to her relations.

The Malagasy language is strikingly poor in words expressing relationship. *Vady* stands for husband and wife, *rai* is the name for father, *reni* for mother, but both expressions, like the Arabic *abu* and *umm*, are frequently used in an extended and figurative sense; thus any flowing water is called *renirano*, that is "mother of water." Stepfather and stepmother are named *raikely* and *renikely*, literally "little father" and "little mother."

Grandfather and grandmother are expressed by the almost literal translation *raibé* (*bé* = great) and *renibé*. Other relationships are either not indicated at all or are expressed by a circumlocution.

The Malagasy have no family names, which often makes it very difficult to distinguish between the numerous persons of the same name. Names of plants and animals are used at pleasure as proper names, the syllable *Ra* being generally prefixed. Many names sound quite poetical and are uncommonly long—as *Ravinahitriniarivo* (literally: “Thousand blossoms of the grass”); on the other hand, they have a liking for thoroughly ugly names such as *Rafiringa*, *Rabetay*, and it would be somewhat droll if we had to translate these names and address those to whom they belong as “Mr. Dunghill” or “Mr. Muchdung.” Biblical names are also in frequent use, as well as European proper names, and to these the syllable *Ra* is prefixed: thus from Joseph, Andrew, are formed *Rajosefa*, *Ranandresa*. It is considered impolite to utter the name of the sovereign. When a child is named, the parents give up their former names and call themselves after their offspring, the father prefixing the name *raini* (father of), the mother *reni* (mother of). Thus if the father's name is Rakoto and he gives his daughter the name of Rasoa after her birth, he becomes Rainisoa (Soa's Father) and the mother Renisoa (Soa's Mother). On entering office rulers always take a new name. Since the royal family of Madagascar surrendered their power to the French this custom has of course fallen into abeyance. Among the Sakalava the strange custom prevails that the name of the sovereign is no longer used after his death, but his memory is perpetuated by a special posthumous name.

Circumcision is generally practised in Madagascar, but in none of the tribes has it any religious signification. Before Christianity was introduced among the Hova this

operation was accompanied by grand ceremonies and rejoicings, at present it is carried on in secrecy. Even the Sakalava avoid all external show, and only when the operation has been successfully accomplished, that is without any harmful consequences, is it celebrated by a thanksgiving feast. The Bara proceed somewhat more ceremoniously, according to Richardson, for they employ a soothsayer to fix the most suitable time, and for this he receives half an ox and a spear.

The custom of Blood-brotherhood so widely spread among African peoples is practised by nearly all the tribes. Those who enter into a bond of this kind pledge themselves mutually to perform the most devoted acts of friendship. Some blood is taken from the breast of each of the future *blood-brothers*, it is mixed with other ingredients and stirred up with spears, the two contracting parties then drinking some of the mixture. Alfred Grandidier entered into a blood-brotherhood of this kind with the chieftain Zomena. The ceremonies were very elaborate, but the blood used was that of an ox. Afterwards the relations of the chieftain came to pay homage to their new relative.

The well-known adventurer Benjowsky succeeded in getting the chieftains of Antongil Bay to pledge themselves to him by means of blood-brotherhood, and ultimately to allow him to be proclaimed as king over them. This trick caused great surprise in Paris at the time, but it really had no great significance, considering that even at the beginning of this century a simple corporal succeeded in raising himself to the position of king of Tamatave. An important part in the life of the natives is played by *Fady*, in which there is not much difficulty in recognizing the *taboo* of the Polynesian peoples, with but slight alteration. *Fady* signifies inviolable, not to be assailed, sacred, but also at the same time unlucky, and thus plants, animals and all kinds of other objects

become subject to *Fady*-laws. Superstitious ideas are abundantly combined with these mystic consecrations. A portion of the forest which has been spared by a forest fire is denoted as *fady*. It is forbidden to cut down wood there or even to gather herbs. In many places, as in the south, it is the fowl which is *fady* and is abhorred, among some tribes the same holds of the pig or the dog. When I was going to shoot the great lemur, (Indris) called by the Malagasy *babakota*, my guide seized my weapon, with the cry "Fady". And when in spite of this I brought the animal down, all hospitality in the village where I lived was withdrawn from me. The lemur is held sacred as being the abode of the spirits of their ancestors and also as the progenitor of the Malagasy race. Certain days in the month are *fady* and count as unlucky. A child born upon one of these days is put to death unless it has been possible to save it by a formal decision, which often costs a great deal. This was formerly common and was one material cause of the slow increase of the population. Certain numbers are lucky, others unlucky; the Bara have a great objection to the number *one*, so one must never offer them a single object. The Hova assign an unlucky significance to *six* and *eight*, while *twelve* is an especially lucky number.

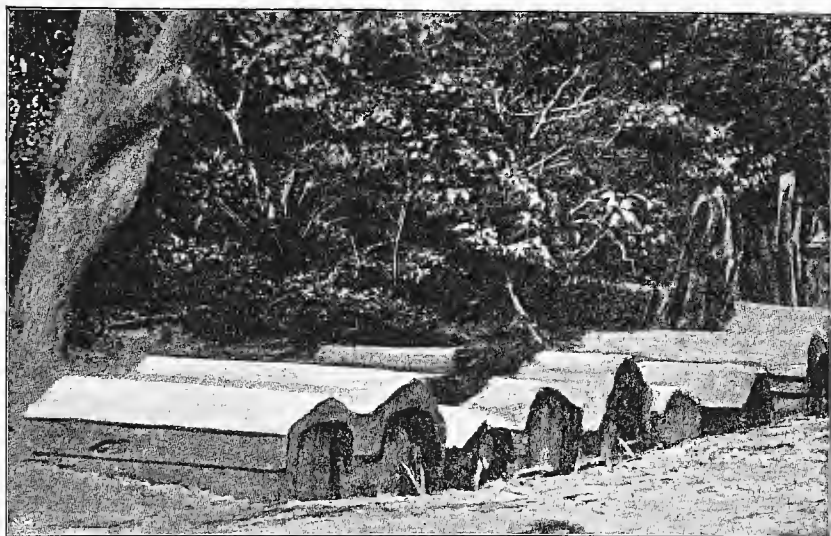
Fabulous beasts and plants play no light part in the imagination of the Malagasy. Thus they have made up the *Songomby*, a swift-footed animal as big as an ox, that devours men, and the nocturnal *Tokan-dia* whose fore feet and hind feet have grown together in one piece, but which none the less runs with fabulous speed; then there is a rare beast with red horns which is said to live in the water. Some years ago a notice went the round of the papers, describing a man-eating tree, the crown of which had flexible snakelike appendages, and which formed the object of religious worship; but in this case it seems that the fancy of a traveller outstripped even that of the inhabitants.

Strange customs relating to sickness and death prevail in Madagascar. Among the Sakalava the sick are taken secretly to a secluded place, and no one visits them with the exception of the nurses. The Tanala are said to expose their sick relatives in the forest and to receive these unhappy people with showers of stones if they happen to return to the village. The approach of death is generally thought of as frightful and terrifying, but cases were known in the time of the persecution of the Christians when natives endured martyrdom with great steadfastness.

Concerning burial, customs differ greatly in the several tribes, yet we may remark a great reverence for the dead throughout the whole island, springing indeed from the religious belief that the deceased acquires divine power and may be propitiated by prayers and sacrifices.

Among the Hova the body is enveloped in dark red silk: without a coffin. The funeral takes place as a rule on the first day after death. The bier is followed by people with paper fans which are then stuck in the earth on the grave; the bier is held thenceforth to be unclean and is never made use of as firewood. The Hova graves are cubical chambers with walls formed of hard basalt. The heavy slabs have often to be brought from a great distance, thus giving employment to a great number of people. The well-to-do Hova begins the building of his grave years before his death, and often spends considerable sums of money on it. His relations and fellow-villagers are at his disposal without pay for this labour of love, yet the expense is often considerable, as their keep, amounting to many oxen, has to be supplied. Of old the graves were of loose stones roughly put together, but the best modern graves are made of masonry and often provided with rich architectural ornamentation. When the kingdom of Madagascar was still in existence, extraordinary mourning ceremonies were held on the

death of the sovereign. When Radama I. died, the wearing of bright ornaments or conspicuous clothes was forbidden, greetings and merry-making were interdicted, spirituous drinks were not to be indulged in. The subjects of the late king had to shave their heads; the wearing of silk clothes, the preparation of clay vessels, working in the precious metals, the manufacture of sugar



Burial-place of the Betsimisaraka.
(From the *Revue Générale des Sciences*.)

and plaiting of straw were suspended for a considerable time.

Among the Betsileo there are grave-vaults above ground as well as those underground. These last are often carried down to a remarkable depth and can only be reached by a steep descent. The vaults above ground have again the cubical shape and are built up of small flat stones. In many places the grave is surrounded by

a balustrade of stakes and posts tastefully carved. The custom, now abandoned by the Hova, of sticking upon these balustrades the skulls of the oxen slaughtered for the funeral feast, is still often kept up in Betsileo-land.

Among the Betsileo is also found the custom, equally strange and loathsome, of tapping the body as it decays and collecting what runs from it in great earthen pots until nothing is left but skin and bone. Sibree says of the Sihanaka, that they carry the body over freshly slaughtered oxen. A certain number of these animals are placed beside the way which the funeral procession has to take, and at its approach one ox after another is killed with a spear, and the skulls are then stuck on high poles. Memorial poles of this kind generally stand in groups at the entrance of a village. The Betsimisarakana and other tribes of the East do not bury their dead in the ground, but lay them in rude wooden coffins which are disposed in rows in a shady wood or in the primeval forest. In the interior of the island I have often observed the skulls of oxen on wooden poles. Among the Bara, according to Richardson, a terrible howling is raised, accompanied by the discharge of musketry, on the death of one of the tribe, and the third part of the oxen belonging to the deceased is killed before the burial takes place. The naked corpse is either laid to rest in the earth and covered with a long heap of stones three feet high, or a cave in the rock is made use of, and in this they deposit the corpse. The entrance is closed with stones and on these they fasten the skulls of the oxen slaughtered at the funeral. The place of burial is held sacred and no one may tread there.

I had the opportunity of attending a funeral ceremony among the Sakalava. A woman who had died of apoplexy was forthwith wrapped in white cloths, and near her were placed several pots of incense. All day long the mourning-women were entering the house to chant their funeral

songs; in the next house the relations were lamenting and the mourning-women were consoling them. Two drummers and two fiddlers paraded round the two houses with music, followed by persons of both sexes. The mourners received meat, rice and rum throughout the day in the courtyard. An ox was slain, and first they boiled the entrails and then the flesh, hide and all; the four feet were cut off and placed on a sand-heap. The burial took place early in the morning. The body was deposited in the hollow trunk of a tree some six miles distant. A small flag indicated the place; near this an offering was placed, consisting of a bottle and a plate of rice. In the north of the island the bodies are said to be subjected to a kind of mummification before burial. As I have been informed, it is customary among the Sakalava, but only in the case of persons of high rank, not to place the body in the coffin until after some weeks. Until mummification has taken place, they throng round the body every day, and no one dares utter a single complaint about the bad smell.

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CHAPTER VII

POLITICS AND RELIGION

SHARP lines of separation between the different classes of society have developed themselves in the Malay element of the population of the island. The lowest caste is that of the slaves, but it must be remarked that slavery possesses a certain patriarchal stamp among the Hova and has thus universally preserved a relatively mild character. The slave often conducts himself with greater freedom in the family than is permitted to European servants, and rough treatment seldom falls to his lot. As to its origin, slavery is to be traced back to different sources; first there are prisoners taken in war, dating from the times when the Hova carried on cruel raids to strengthen their rule; the males of the conquered tribes were relentlessly put to death, the women and children were carried off as slaves (*andevo*) to the Central Province. Others who are designated *Zaza-Hova* are of the same origin as the Hova, but have been condemned to slavery for crimes or debt.

The second caste embraces the free citizens—the Hova in the narrower sense of the word. Their higher position is expressed in social life by the custom that they make their slaves carry their things for them when they go out, and that when acting as soldiers they frequently get even their muskets and lances carried for them in the campaign. The government is entitled to exact from them all kinds of forced labour, for which they only receive payment in exceptional cases. Many of the citizens

have become opulent, and they often possess a remarkable business faculty.

The highest caste embraces the nobles or *Andrianes*.



Hova Slave-woman (water-carrier) in Imerina.

A few clans are descendants of old ruling families to whom special privileges have been granted; these nobles are often greatly impoverished, "As poor as an Andriane"

being a proverbial saying in Madagascar. A certain air of distinction in personal intercourse is peculiar to them. They are indebted for their rank to birth alone, but, on the other hand, there exists a kind of military nobility independent of birth, whose rank is indicated by numbers.

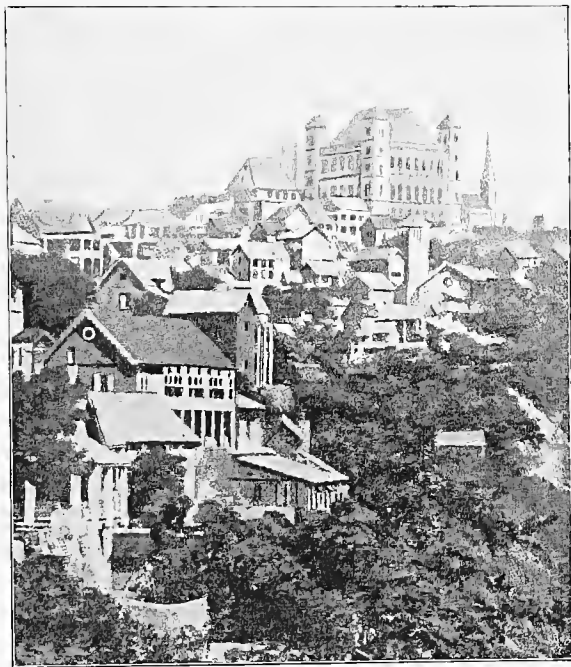
When Radama I. commenced the organisation of an army after the European pattern, different grades of honour were instituted in the Hova army. They went up to the "sixteenth grade", the highest of all, but this was conferred only on a few.

The separation of the classes also influences marriage. Among the Hova, who like to contract marriages with relatives and seldom marry outside their clan, unions between nobles and citizens or between citizens and slaves never take place.

The course of politics during the present century presented a noteworthy spectacle, in that even the Malayan element made an important start in working out more highly developed political institutions, and in setting up a monarchy of a peculiar character. The Negro element was subject to rulers whose sphere of power never extended far, although up to the beginning of this century there were a few powerful rulers of considerable influence in Sakalava-land. Later on took place a splitting up into numerous small principalities, whose want of unity necessarily led to weakness. On the east coast European adventurers have repeatedly worked themselves up to supreme power.

At the commencement of this century the energetic Radama I. began to raise up a royal power which secured the rule over a large part of the island to the Hova. The Hova could rule, for he knew how to obey. Intellectual superiority, the introduction of European arms and, lastly, a subtlety in diplomacy which is not to be undervalued, secured the existence of the Hova kingdom till quite recently. Even the powerful Sakalava tribes were

subjugated, though the acknowledgment of Hova sovereignty was rather a nominal one, and their sphere of power reached only as far as the military posts were maintained.



View of the former Royal Palace at Antananarivo.
(From the *Revue des Sciences*.)

The Hova Kingdom has now only a historical significance, as it has been shattered by the French. The once all-powerful prime minister died in banishment, the last queen, Ranavalona III., to whom only a phantom of sovereignty was left after the French invasion, was dethroned in 1897 and is at present living in exile on

the island of Réunion.* It is well worth while, however, to bestow a few words of consideration on that now defunct kingdom, if it is only on account of its unique character. It is an evidence of the equality in the position of woman in the family, and the high outward respect accorded to her, that besides the Kings, several Queens have borne sway among the Hova; the monarchy, however, was not without limitation, for the strange custom had arisen that when a Queen ascended the throne she was obliged to marry the prime minister. During recent decades the King-consort was the ruler of Madagascar in reality, if not in name. This system led to abuses which in some measure explain the ease with which the French were able to make their way to Imerina with a relatively small body of troops and to gain possession of the capital, Antananarivo, without any effective resistance.

When a sovereign came to the throne, persons of high rank and representatives of the several tribes had to take an oath of allegiance. The ceremony was accompanied by "Calf-sticking". During the taking of the oath the parties concerned had each to hold a spear, standing round a calf, that was then put to death with the spears. This was to signify symbolically that the oath-breaker would have to expect the fate of the calf. For the poorer persons the ceremony of *Velirano* or water-beating sufficed. When the Queen went out, a scarlet umbrella was always held over her head; the crowd had to make room and bow reverentially with outstretched hands as Her Majesty passed.

A similar honour had to be shewn to anything belonging to the sovereign which was being conveyed through the streets; the people made way and uncovered their heads, and any one who failed in his duty in this respect was reminded of it by a lance-prick from a spearman who preceded the convoy.

* We believe that this queen is now living in Algeria.—TRANS.

Assemblies of the people played a great part in the government. On the publication of a royal message, the people streamed in from all sides towards the capital and awaited the arrival of the officials, who were accompanied by bands of music and soldiers in uniform. In important cases it was the prime minister who presented himself before the people with great pomp and displayed all the arts of a brilliant orator, supplementing the animation of his words by passionate gestures, tearing from his shoulder his picturesque lamba and throwing it on the ground, or flourishing about his spear. Then the assembly would also be seized with enthusiasm, which was expressed by leaping from the ground and by acclamations of assent. A Malagasy *Kabary* always presented an imposing spectacle to a European. Transgression of the laws was severely punished, and an iron discipline was maintained. In former times the Trial by Ordeal or the judgment of God played a fatal part in Malagasy jurisdiction. A kind of ordeal by poison, the so-called Tangen-trial, stood in high esteem among the people even in the middle of this century, and the Hova government still applied it to the discovery of crime. Pieces of the fruit of the tangen tree (*Tanghinia venenifera*) were administered to the delinquent, and if these were vomited his innocence was proved. This tangen tree in some degree resembles an oleander in its mode of growth. It blooms at the end of September and bears from 20 to 25 blossoms at the end of its thickly-leaved branches; the flower-buds are of a red colour. The spherical fruit is of the size of an apple, and the soft pulp has a kernel as big as an almond, which contains an active poison. In small doses it acts as an emetic, but taken in larger quantities it destroys the most important nerve centres of the vegetable functions. According to the information I received, it seems to have lain in the power of the judge

to save or to destroy the accused, for he could, according to his own conviction as to guilt or innocence, administer either a weak or a powerful dose. Thousands fell victims to the tangen-trial in barbarous times, and it contributed materially to the decrease of population in Madagascar, as it was often a means of satisfying personal vengeance. In 1865 English and French influence succeeded in bringing about the abolition of this cruel judicial proceeding, and it must be acknowledged that the Hova government acted with great decision, going so far in their reforming zeal as to destroy the tangen trees, so that at present only isolated specimens on the east coast are to be met with. One portion indeed of the conservative nobility rose against this innovation and even withdrew from the capital in order to continue the practice of poison-trial elsewhere. A lady of noble birth who stood at the head of the movement was condemned to death, but her life was spared on payment by her relatives of a fine of 10,000 silver piastres.

Another ordeal is the crocodile-trial, in which the accused is brought to a river, and the judge standing behind him makes a speech to the crocodiles and then calls upon the man who is accused of crime to swim over the river and back again. If he succeeds in doing this without injury his innocence is proved. As the waters in Madagascar teem with crocodiles, this trial by swimming is a truly dangerous one.

The development of religious life has brought about important changes during this century. The inhabitants were originally heathens and worshipped a being of a distinctly fetish stamp. The belief in magic and the employment of amulets of different kinds are even yet widely spread. At the beginning of this century certain idols enjoyed universal veneration among the Hova, and besides these there existed idols for single localities and for the house.

The chief idol, the protector of the royal house, was located in a special building twenty-five miles east of the capital. The office of Guardian of the Idol was highly esteemed; it was endowed with privileges and was hereditary. Each idol had its special *Fady*; for instance, the Rakelimalasa, consisting of three pieces of wood from a sacred tree, forbade the use of pork or shell-fish as well as of uncooked food. Another idol, which healed diseases, consisted of two lizards roughly carved in wood. In 1869 all symbols of heathenism were burned by order of the government, the priests were in consequence without means of sustenance and this was not without serious political consequences.

Sacrifice is still practised in many localities; the most highly considered victim is the ox, but goats, sheep and fowls also serve as offerings. Generally only the fat and the blood are offered up, the flesh being eaten. So late as the eighties a Hova would often offer up an ox in the open place of his village in thanksgiving for having returned with a whole skin from the war going on at the time against the French.

Originally the Malagasy had no temples, though they recognized sacred places and altars. Among the Bara a tamarind tree was considered as a sacred place, and mats, baskets, locks of hair and the like were deposited before its trunk. The Hova in early times evinced a special reverence for old graves and remarkable rocks. Among the Sakalava, barren women often performed pilgrimages to a certain renowned rock in order to pray for offspring.

It is well known that superstitious ideas are widely spread among the Malagasy; even at the present time, in spite of the introduction of European culture, sooth-sayers (*sikidy*) hold a prominent position among the Hova.

The belief in departed spirits is diffused everywhere,

though the conception of their condition is somewhat indistinct. The place where the spirits of the departed are assembled is called *Abondrombé*, the Malagasy Hades; it is a lofty inaccessible mountain between Betsileo-land and the Tanala district, and the natives are unwilling to intrude upon it.

Christianity was introduced into Madagascar in the present century, and, after external difficulties in the beginning, began to spread with unusual rapidity. The Protestant missionaries of the London Missionary Society displayed remarkable energy, having begun their activity in the year 1818. They founded schools in which the natives were able to enjoy regular instruction. After sixteen years of activity there were many congregations of Christians in existence, but under the reign of Queen Ranavalona I., who was hostile to the English mission, the persecution of the Christians began, and many of the converts lost their lives or suffered severe persecution in other ways. When she died in 1861 Radama II. came to the throne. He was of a sympathetic nature and well disposed towards European reforms. His rule, however, suited neither the conservative Hova nobles nor the political aims of England. He was murdered soon after his accession, and it was openly asserted at the time that the conspirators were frequent visitors at the house of a prominent English missionary. Queen Rosaoharina was more shrewd; she threw no obstacles in the way of the English missionaries, but at the same time she did not favour them, for she understood well that the spying eyes of the British in Mauritius were following the affairs of Madagascar with increasing interest, or at any rate that they were kept well informed by the mission.

A decided change to the advantage of English influence took place in April 1868, when this Queen died and Ranavalona II. succeeded to the throne. She and her

prime minister passed over to Christianity in the following year and received baptism in the presence of a great assemblage ; the idols of the ruling family were destroyed and the guardians of the idols were dismissed. Thus the example was given to loyal subjects to pass over to Protestantism *en masse*. It afforded deep satisfaction to the native clergy to give proofs of their inborn talent for oratory as preachers. Sibree emphasizes the fact with much satisfaction, that by the adoption of European modes of life and European dress practical advantages had been gained for trade, and that each missionary meant the value of two to three thousand pounds sterling for English imports. Numerous schools and churches have been built. At the present time the Protestant mission of the English in Madagascar counts 68 missionaries, some 6000 native assistant clergy with 310,000 native christians, 1300 churches and 1176 schools. Three printing-presses, two hospitals and one lazar-house are supported by an annual budget for the needs of the combined mission which has grown to about a million. Besides the English there is also a Norwegian mission.

In the year 1830 the French Jesuits were already beginning to make their propaganda for Catholicism. Their success was at first small, but it slowly increased in later times, and at present a hard struggle is going on between the interests of English Protestantism and the French Jesuit Mission, which may very likely end in the victory of the latter. No wonder, for when at the time of the last French invasion the hard-pressed Malagasy turned in their need to their brethren in the faith in England, who had done a good stroke of business with them, they were left miserably in the lurch. The Hova are practical and intelligent, so the natural consequence will be that they will endeavour to stand well with their new rulers and will more and more join the French

Jesuits. These have already some 130,000 adherents among the Malagasy, and support 600 schools. Even among the northern Sakalava they have attained a certain amount of success. It is worthy of mention that besides a cathedral the French missionaries have built a beautiful observatory in the Capital, for the service of astronomical and meteorological science.

CHAPTER VIII

HISTORY OF EUROPEAN COLONIZATION

It is probable that no other spot of the earth is able to present in the history of its colonization a tale so complicated and so romantic as Madagascar. Hesitating or planless groping on the part of the Europeans lasted for two centuries and a half, until after long throes a legally recognized colony has at last come into the world. In truth the history of these attempts only teaches us how not to colonize!

More than a century had elapsed since the discovery of the great island, and not a single European power had given it any serious attention. The Portuguese, the Spaniards, the English, had indeed visited certain points on the coast incidentally, in order to look for the natural resources or to initiate temporary trade connexions, but no one attempted to form a permanent settlement.

It was not till the year 1642 that a certain Rigault from Dieppe formed a company and obtained from Richelieu the right of founding a colony in Madagascar and the surrounding islands for the purpose of trading. The concession was only to hold good for ten years. The new company at the same time undertook the duty of taking possession of Madagascar in the name of the King of France. The earliest claims to lawful possession raised by the French were based upon this concession,

In September 1642 the colonists landed in the south of Madagascar. The agent of the company was one Pronis, a good-for-nothing fellow, whose want of skill was only surpassed by his brutality. The surroundings of

their first settlement proving unhealthy in the highest degree, it had to be removed to another locality and there Fort Dauphin was erected. Negligent and bent only on his own advantage, Pronis treated the colonists with the greatest cruelty, so that soon an open insurrection broke out. The relations with the gentle natives soon turned to a state of open warfare. Pronis promised a planter of Mauritius to supply him with 73 slaves for field work, and when these were to be fetched away by Captain Vandremester the unscrupulous agent simply kidnapped the stipulated number of natives and sent them on board the ship, a piece of treachery which stirred up the deepest resentment among the natives. No wonder Pronis was ultimately put in fetters by his own countrymen in Fort Dauphin. When intelligence of these disorders was received in France the Rigault Company sent Flacourt in 1648 to undertake the management of the business. He was an upright man in himself, but did not understand the right way of managing the Malagasy, accustomed as they were to liberty; he acted with excessive rigour towards them, and in two years destroyed fifty of their villages.

The concession to the Rigault Company came to an end in 1652 without any result worth naming, but it was renewed for another 15 years under the condition that the Company should be entirely reorganized, and it was only through the admission of the Duke de la Meilleraye to the Board that the undertaking was enabled to continue its operations to the year 1668. Champmargou was placed at the head of the reorganised company, and he endeavoured to win over the natives in a peaceful manner, but owing to his narrow-mindedness he committed all sorts of indiscretions; not only did he quarrel, from jealousy, with his ablest assistant, Lacaze, but he hit upon the unlucky idea of getting a Lazarist priest to come from Paris with the object of converting the natives to

Christianity in the most intemperate way. This fanatical Lazarist, a certain Père Etienne, betook himself to Dian-Manong, the most influential chief in Southern Madagascar, made his way into his house, collected all the amulets and idols and threw them into the fire. The chief, enraged at this unheard-of outrage upon the peace of his house, strangled the over-zealous Father without more ado. The French in Fort Dauphin wished to take vengeance; they set out against the chief with a considerable force, but were unsuccessful and had to retreat, even running great danger of starvation.

Great ideas were prevalent in France at that time. The minister Colbert, who clearly perceived that the new company also was about to make a fiasco, abolished its rights as early as 1664. He thought to make a France of the East, "*Gallia Orientalis*," out of Madagascar and the surrounding islands. An East India Company was formed with a capital of fifteen million francs, to which the Court alone contributed five millions, while numerous cities, Lyons, Rouen, Bordeaux, Nantes, Toulouse, Dijon, Metz, Marseilles etc. took shares for considerable sums.

The East India Company with its headquarters at Fort Dauphin received the monopoly of trade with Madagascar and the Mascarenes in perpetuity. The first ships of the new company sailed on the 5th of March, 1665. On arriving at Fort Dauphin the new company perceived at once that the natives must be approached in a friendly way. They bestowed marks of distinction on the former assistant, Lacaze, who had made himself much beloved by the natives, and his diplomatic skill soon brought about a reconciliation with the powerful chief Dian-Manong.

In a few years the necessary buildings were constructed and extensive plantations were laid out. All went well till 1670, when Admiral La Haye succeeded to the management of the concern, which was now to be conducted on behalf of the King of France. The

new commander succeeded in setting all the world against him by his arbitrary conduct; the reign of terror as it existed once before under Pronis and Flacourt recommenced. A certain chief did not hurry himself to present his homage, and La Haye, too autocratic to wait, sent out a force of 1300 men to chastise him and suffered a complete defeat.

The natives, who had been deceived so often by friendly promises, set on foot a general rising. La Haye fled from Madagascar, while the Frenchmen who remained behind endeavoured to come to terms with the natives. These, however, declared that they had quite lost faith in Europeans; they stormed Fort Dauphin and put the French to death to the last man. This took place in the year 1672. The fruits of the thirty years' attempts at colonization were thus utterly destroyed.

Louis XIV. was too much taken up with European matters to concern himself any further with Madagascar. Colbert died, and it was considered sufficient in 1686 to declare the island to be crown property; this declaration was renewed in 1720 and again in 1725.

The first phase of serious colonization came to an end with the disaster of 1672. France might till then, with a little tact, have obtained a peaceful conquest of the island in spite of initial mistakes. Now the island became part of the royal domain, but no one ventured to have anything to do with it.

Later begins a second phase, during which the strangest adventurers went in search of fortune, after nothing had taken place in Madagascar for a century or so.

Before all must be mentioned the Count Benjowsky, one of the drollest figures of the last century, a captivating personality, with a past life of many vicissitudes; one who, with the education of a man of the world, possessed unusual energy, and one about whom we are frequently in doubt whether his conduct sprang from

lofty inspiration or from excessive vanity. This Polish nobleman had entangled himself in a conspiracy in St. Petersburg and was in consequence banished to Kamtschatka. There he succeeded so well in ingratiating himself with the governor that the latter gave him his daughter in marriage. Soon after his marriage he escaped, and landing first at Formosa, entered into negotiations with the chiefs of the natives there and gained their consent to a European protectorate; later on, a French ship brought him to Mauritius and to France. In Paris they took a fancy to this piquant nobleman whose deeds were in everybody's mouth. Benjowsky was for a time the lion of the day and all salons were open to him. Even the government interested itself on his behalf and bestowed on him the command of a regiment of infantry; he accepted it on the condition that he should be employed in the colonial service. The idea of colonizing Formosa revived in his mind. The Secretary of State assented, only the attempt was to be undertaken in Madagascar and not in Formosa. Benjowsky declared himself ready to found a settlement in Madagascar, to gain the confidence of the princes and kings of the island and ultimately to lay the protectorate over the whole island at the feet of the King of France. The Government of Mauritius was to furnish him with what he required for the first few years, but in return was to exercise control over his magazine. Benjowsky left France in May 1773 and came to the Isle of France (Mauritius) in September of the same year. Here, however, the government persistently thwarted him, but ultimately he collected sufficient men and landed in Antongil Bay (1774), where he founded the settlement of Louisbourg, displayed extraordinary activity and soon succeeded in winning over the surrounding tribes.

For reasons which are not fully explained he was left entirely in the lurch by the authorities in Paris,

while the Government of Mauritius worked against him in every way. Nevertheless, the undertaking in Louisbourg thrived wonderfully and even excited a desire for plunder on the part of the Sakalava.

In the year 1776 the clever founder caused an inquiry to be made by the colonial government into the position of the concern, and is said to have shewn a profit of 450,000 francs; then he sent in his resignation of the post of Governor, as he wished to trade on his own account. Benjowsky brought about a great assemblage of the natives, drank blood-brotherhood with the chiefs and was solemnly elected *Manjaka Bé*, that is "over king" of the natives. A few days later a kind of constitution was accepted by the people. With this Malagasy kingship in his pocket, our adventurer, full of hope, sailed for France in December 1776, in order to offer his possession to the Ministry. In Paris they had long ago found another ephemeral idol; they bestowed on Benjowsky a sword of honour and gave him a hint that he had become inconvenient. Perhaps France did wrong; even if Benjowsky was an adventurer, he might yet, under proper supervision, have rendered useful service. He, disillusioned, went to Austria and to England, but the "King of Madagascar" found no hearing, and ultimately an American house in Baltimore supplied him with goods and a ship which brought him again to Madagascar. He was soon to meet his end in a quarrel with a Creole trader. The government of the Isle of France mixed itself up in the affair; sixty soldiers were sent against Benjowsky, and a bullet put an end to his eventful life on the 23rd of May, 1786.

The attempt of Benjowsky was not quite fruitless, for in the following year numerous Creole traders from Bourbon and Mauritius (Isle of France) were attracted to Madagascar and did good business there. The French Colonial Government even thought it well, in 1804, to

establish a special trade agency in Tamatave, over which they placed Sylvain Roux. This man had to give way to the English in 1811, when the latter took the island of Mauritius from the French. Sir Robert Farquhar then made his appearance as English governor of Mauritius and pursued great aims in Madagascar. From this time begins a long period of quarrelling, an embittered struggle between English and French interests, which has only come to an issue during the last few years. In a treaty in 1815 France formally ceded to England all rights over the Isle of France and its dependencies. Under the head of these dependencies were understood Rodriguez and the Seychelles, as was expressly stated in Article 8 of the Treaty of Paris. Sir Robert Farquhar wrote to the French governor of Bourbon, at the beginning of the year 1816, that properly Madagascar also formed a dependency of Mauritius and that England claimed full rights over the great island. English garrisons were placed in Tamatave and Foule Point. The interpretation of the treaty of 1815 placed the "inborn bashfulness" of England in its right light, and it was, to speak mildly, an act of coolness without a parallel. When a protest was raised from Paris, however, England, at the end of 1816, thought it well to forego her unfounded claim.

Farquhar soon recognized that he must find some other way to paralyse the Sister Colony of Bourbon. Madagascar was a good market, which must be conquered economically and politically, even if the French claims were recognized.

The island had been till now without political unity. Twenty or thirty tribes, with different and often antagonistic interests, lived side by side and were often at war among themselves. The Sakalava of the west were the most powerful. But at the beginning of this century the Hova tribes, till then scarcely considered, began to gain in-

fluence. Broken up in earlier times into small states, they were united into a single state by the chieftain, Andrianimpoina, the founder of the later Hova dynasty, and they endeavoured to extend their power. In 1810 his son succeeded to the throne as Radama I. He is represented as an energetic king, who carried on his father's policy of conquest, subdued the Betsileo in the south and the Sihanaka in the north, and by his power and his skilful diplomacy reduced even the Sakalava to dependence.

Farquhar formed the idea of playing off King Radama I. against the French; he sent ambassadors to the court of Imerina with rich presents and brought about a "Treaty of Friendship" in which Radama was recognized as king of Madagascar, but England reserved the right of maintaining a diplomatic representative in the Hova kingdom. Such a representative accordingly made his appearance a few years later in the person of James Hastie. This man displayed feverish activity. A Hova army after the European pattern was created by his influence, the rights of the popular assembly, or Kabary, were curtailed, and the dependence upon Mauritius was constantly drawn tighter. When, in the twenties, the French again attempted to settle on the coast of Madagascar it was signified to them from Mauritius that Madagascar was an independent kingdom, recognizing no claims on the part of any European power. The French settlements were attacked by the Hova, Fort Dauphin was taken and the French flag was torn down. An official decree promulgated on the other hand, by Radama I., in the year 1825, guaranteed to the English merchantmen the right of entry to the harbours of Madagascar and to all English merchants the free right of settlement in the island. Farquhar had thus carried out his plans boldly and skilfully, while France remained inactive.

Radama I. died in 1828, and a revolution broke out;

the old noble families, who had been deprived of their influence by this powerful king, set up a kind of oligarchy, and made themselves masters of Radama's widow; she had to marry one of their number and ascended the throne under the name of Ranavalona I. This suspicious, miserly and cruel woman had an antipathy to Europeans, and soon, evidently influenced by the Hova nobility, took up a hostile attitude even to the English, who had gained considerable influence through their missionaries. (They numbered 4000 believers in their congregations at the death of Radama I.) At first the English mission was tolerated, but afterwards, at a great popular assembly in March 1835, the command was issued that all Christian officers should be cashiered.

The English mission left the capital, as their continuance there was to no purpose. A law of 1845 put Europeans on an equality with natives, they might be drawn for forced labour, they had to submit to the tangen-trial, and in case of condemnation might be sold as slaves. Practically the Europeans were thus shut out from the island.

In spite of Queen Ranavalona's dislike to the whites, two Frenchmen, Lastelle and Laborde, succeeded in obtaining an extraordinary influence over her; the former made himself useful by founding a great agricultural undertaking as well as by introducing European fire-arms; Laborde gained the sympathy of the court by his skill in industrial matters. He conducted iron foundries, and factories for the production of indigo, sugar and rum, the profit from which was pocketed with delight by the avaricious queen; besides this he had a fatherly affection for Prince Rakoto, the heir to the throne, in whom he placed the greatest hope for the future development of Madagascar. Lastelle and Laborde were able to gain a powerful influence over the receptive mind of the prince, and they had the idea

of making the island more accessible to Europeans by his help.

In the year 1855 a third Frenchman, of the name of Lambert, appeared in the capital by the queen's desire. He had a house of business in Mauritius and during the previous year had rendered great services to the Hova government. Lambert was a busy-body, a remarkable mixture of the adventurer and the intriguer, evidently filled with political ambition, but without diplomatic talent.

Being made acquainted with the treaty of friendship formed by his two countrymen and Prince Rakoto, he immediately formed a "Combination". The queen was old and sickly, so that Rakoto had the expectation of coming to the throne in a few years; the inexperienced prince was induced to place his country under the protection of France, and Lambert was to travel to Paris and win over Napoleon III. to the idea. The latter was not disinclined, but had to pay regard to public opinion in England, so he first sent Lambert to the Foreign Office in London, where he set forth his plans down the smallest detail. Lord Clarendon listened to him attentively and informed him that the project would rouse opposition in England. The Secretary of State immediately sent for the Rev. William Ellis, a dexterous man who had previously been entrusted with a mission to Madagascar, to form an alliance with the Hova. Ellis set off at once for Antananarivo, in order to make known to some influential men among the Hova what was taking place behind the back of the Queen. In the palace there was talk of a conspiracy set on foot by Laborde and Lambert, and the Frenchmen were forthwith banished, orders being given to the bearers to choose the most unhealthy route to the coast and to spend fifty days on the way, so that fever might have time to do its work. The enraged Queen proceeded to

organise a systematic persecution of the Christians, and the Hova converts were either put to death or despoiled of their goods and made slaves of. They were the victims of the intrigues of Lambert and Ellis.

The Queen died on the 14th of August, 1861, and Prince Rakoto succeeded her on the throne under the name of Radama II. He immediately summoned to the capital his former friends Laborde and Lambert, and named the latter his representative in Europe. The notorious Lambert Charter was drawn up in his favour, empowering him to form a great company for the utilization of the resources of Madagascar. By this the French protectorate was abandoned in form, but its influence remained as strong as ever.

The young King, badly advised by his friends and without consideration for the feelings of the grandees of his Kingdom, allowed himself to be drawn into a venturesome and hazardous course by his reforming zeal and his unpractical idealism. He abolished forced labour and suppressed the custom-houses. He thus deprived himself of the necessary means of maintaining the State, and deprived many influential Hova of their positions. He openly quarrelled with the most eminent Andriane families, and even the English found the politics of the new sovereign in the highest degree inconvenient for their aims. The venture had a fatal issue: it was not quite by accident that the Rev. W. Ellis again made his appearance on the scene. In May 1863 a regular revolution broke out in Antananarivo; the rebels went to and from the house of William Ellis with noteworthy activity. They demanded of Radama II. that he should break with the French, and when he refused, he was strangled in his palace (May 12th). His wife succeeded to the throne, but a prime minister was given to her, a scion of the Hova family Rainiharo, and immediately after his nomination she had to marry him. Since then

the office of prime minister has always remained in this family.

The victory of English over French policy was complete. The undiplomatic Radama II., enthusiastic as he was for European culture, had to pay the reckoning, and he paid it with his life. He was the victim of French adventurers and English egoists.

It must be granted that the English were clever enough to make energetic use of the circumstances of the time. Respectable houses of business from London began to settle in the capital as well as on the coast; the importation of English goods was favoured, missionaries and merchants gained complete influence over the Rainiharo family, which was actually in possession of supreme power. From this time there was always a woman on the throne, married to the prime minister and remaining a mere figurehead. When Rosaoharina died in 1868 Ranavalona II. succeeded to the throne, and in 1883, Ranavalona III. The missionaries displayed conspicuous energy and the Hova kingdom became practically a colony of the London Missionary Society, the political power lay in the hands of the reverend gentlemen, and when any one entered the presence chamber of the prime minister the latter would point with pride to the valuable presents from English clergymen which lay around.

Then came the year 1870 with the terrible defeat of the French. The earth-shaking news from the seat of war was scarcely expected with greater eagerness at Berlin than it was in Antananarivo. The issue of the Franco-German war deprived the French of the last remains of influence with the Hova government.

Prostrate as she was, France was in no wise able to make good her claims, and the Hova, evidently prompted by the English, began to become quite impudent. Several methodists, first Kestell Kornish and

Bachelor, and afterwards Pickersgill and Parret visited the district of north-west Sakalava-land under somewhat remarkable circumstances. Here the French had claims to possession; the disposition of the natives was sounded and their chiefs were invited to pay a visit to Antananarivo, on the ground that this act of homage would make a good impression on the Queen, and would be in the interest of a good neighbourly understanding. Individuals, in fact, came to the capital, were excellently received and were escorted on their return by Hova officers, who brought Hova flags with them and hoisted these in Sakalava-land in places which belonged to France, such as Bavatube and Ankify. They even attempted to lay hands on the French possessions of Nossi-Faly and Nossi-Mitsiu. When France protested, the Queen declared that her kingdom extended to the sea; the Frenchmen settled in the island being continually threatened, the French consul in the capital lowered his flag and took his departure.

In May 1883 French ships of war appeared in the waters of Madagascar. Admiral Pierre bombarded the coast towns of Majunga and Tamatave, in order to land troops there. The prime minister answered this step by banishing the French *en masse* and by sending troops to the coast under the command of an English colonel. Meanwhile regular warfare was avoided; an indecisive struggle took place at Farasate, and the endeavour was made to reduce the Hova to submission by blockading the harbours on the coast.

On the 17th of December, 1885, a treaty of peace actually came about, the leading conditions of which were that the Hova government should remain independent as regards home affairs, but that a French Resident-General should conduct all intercourse with foreign powers. The French on the island were to be under French jurisdiction and might acquire the

possession of land under long leases. Liberty of religious worship was to be recognized; in addition the Hova government had to pay ten millions of francs to satisfy the civil claims, and to cede the Bay of Diego Suarez to the French. A garrison was to remain in Tamatave till the payment of the debt.

It was a delusive peace and did not last ten years.

In the spring of 1886 Le Myre de Vilers took up his position as Resident-General, but the Hova government was in no hurry to carry out the terms of the treaty, and it was only when he threatened to take his departure that the Ministry of Madagascar gave way. On that occasion I enjoyed the curious spectacle of seeing the Hova generals and colonels arrive in their fantastic uniforms in order to set about the delimitation of Diego Suarez, which they did only reluctantly. New differences soon arose; the Queen was not willing to confine herself to the conduct of internal affairs, attempts on French subjects became more frequent. It was asserted that even a nephew of the Queen had taken part in these. The situation of the French residents was becoming more and more alarming.

The French government sent Le Myre de Vilers to Madagascar in order to make an impartial investigation into these occurrences and to obtain the strict carrying out of the treaty of 1885. He was also to insist that no concession of lands or trade privileges should be made over the head of the Resident-General. The Hova Government answered these demands with arrogant, and to some extent ridiculous, counter-claims, thus showing no desire to reform its conduct. Le Myre de Vilers drew up an Ultimatum, but received no answer and set off for the east coast on the 26th of October, 1894. There he received a reply, sent after him by the Queen, that the French conditions were refused.

After experiments had been made in Madagascar for

252 years without arriving at any tangible or lasting result it was indeed time that a decision should be arrived at. Either the island must be definitely abandoned or a solution must be brought about by force of arms. France chose the latter way.

The young republic of France had had many internal troubles to deal with since its establishment; circumstances often enough presented a sad picture of discord, but in the field of colonial policy it began to display praiseworthy energy and made far more rapid advances than the monarchy which preceded it. A war with the Malagasy was decidedly popular in France. People did not conceal from themselves that heavy sacrifices would have to be laid upon the country. To lead a considerable force through fever-haunted swamps, through forests and mountain ranges, in order, sword in hand, to bring about the submission of the Hova at the capital, Antananarivo, was a hazardous affair and would cost many lives.

Patriotism, however, was longing for an energetic deed on the part of the army, and the Chamber without serious opposition voted the sum of 65,000,000 francs for the subjugation of the Hova. This sum, sure enough, did not suffice, for in reality the whole campaign cost 95,000,000. It was not, of course, till the spring of 1895 that it could be undertaken, and it was necessary that it should be brought to a close in Autumn, that is at the commencement of the rainy season. The Hova rested their hopes on the assistance of "General Forest" and "General Fever," as well as on that of England. The last, however, left the Malagasy entirely in the lurch.

The preparations for the campaign were not in all cases of an exemplary character. The numerous blunders and defective arrangements raised much bitterness in France. The boxes of quinine sent to Madagascar for the fever-stricken soldiers were in the beginning nowhere to be found. The plan of operations adopted

proved fortunate, however, in the choice of Majunga on the Sakalava Coast as the starting-point, and in hitting upon a road to Imerina which, though long, was beset with fewer difficulties than would have been encountered in pushing forward from the eastern side.

This remarkable campaign was conducted by General



General Duchesne.

Duchesne. He advanced with great energy and circumspection, and by September 1895 reached the Upland country with his 3500 men and took the Malagasy capital, in full accordance with his original programme. The resistance of the Hova army was wonderfully small, but so also was the support rendered by the Sakalava, on which France had reckoned.

The Queen gave way to the inevitable. She was at first left in the enjoyment of her dignity, but her husband, as being too dangerous a prime minister, was deposed and banished to Algeria, where he died shortly after. The royal lady, who does not seem to have been so very tenderly attached to him, did not shed too many tears on the occasion.

It had been left undecided whether a simple protectorate would be considered enough, but in view of the great sacrifices involved, the French Chamber did not find a Protectorate sufficient, and decreed the complete annexation of the island. In the spring of 1897 the Queen was simply deposed, and to avoid further intrigues or revolutions in the palace was banished to the Island of Réunion. Here she lives, the last to wear the Crown of Madagascar.

Now that the old dream of the French patriots in Madagascar has been realized, it remains to be seen what is to become of this island—so highly blessed with the treasures of nature—now a French colony. A tough battle will doubtless rage in the future between French Jesuits and English Methodists, in which the former will take the utmost advantage of the newly created political situation. If France is able to win over the gifted and active Hova there is little need to be anxious for the future. In the interest of the prosperous development of the economical conditions of the island it is matter for congratulation that the petty jealousies of the European powers have come to an end.

Opinions as to the productiveness of the island are extraordinarily contradictory. While some voices express themselves with reticence, and bring into prominence the wide stretches of barren country, others praise the land for its inexhaustible fertility. To form an impartial judgment as to the actual facts it is well to remember the nature of the various zones described in an earlier chapter.

CHAPTER IX

ORGANIZATION AND GOVERNMENT OF THE FRENCH COLONY OF MADAGASCAR

AFTER the French Chambers had declared (in 1896) that the newly conquered island was a colony proper, a settled organization had to be brought about in order to give the colonists the needful feeling of security in their enterprises.

The establishment of a speedy and solid colonisation was sought for in two directions; the one through an active propaganda in the mother country, the other through the energy of the newly constituted colonial authorities.

The former is carried on in Paris, where a "Comité de Madagascar" concerns itself with the interests of the island. This Committee possesses no official character, but makes its influence felt as an advising council. Its members are savants and travellers, who are accurately acquainted with Madagascar.

This Madagascar Committee desires in the first place to preserve the island from a desultory stream of immigrants. It points out with good reason that colonists entirely without means cannot succeed in competition with the natives, that such colonists soon fall into miserable poverty, become a burden on the authorities and thus bring the colony into discredit. The Committee wishes to encourage those elements especially which can hold out for a few years, and which will at a later period draw after them other people of energy if of less opulence.

Instead of living upon the mother country the island is to be self-supporting and is itself to meet the cost of administration. It is one of the most important things to give encouragement to the larger undertakings by companies, on whom it will be incumbent to construct trade routes and to exploit the natural resources of the island. To indemnify them the state will, after a certain time, give over their leasehold lands to them as their own property. The committee seems to be keeping in view the duty of watching lest a pernicious nepotism seize upon the authorities, and the colony become a charitable institution for superfluous officials.

WK-43
The transition from the old state of things to the new was not carried out without serious difficulties. Laroche, the first Resident-General at the head of the new colony, seems not to have been quite strong enough for the position; in any case his *début* at the Residence at Antananarivo was deficient in energy. The Hova, who had offered no resistance, so to speak, during the campaign, fell back upon guerilla warfare, which apparently found encouragement in the immediate surroundings of the court. The French posts were constantly being attacked, and the roads to the coast were rendered entirely unsafe. One robber tribe to the south-west of the Residence, that of the Fahavalos, became so insolent as to threaten the capital itself.

In September 1896 Gen. Gallieni took over the government. The revolts in no wise ceased, but evidently received support from the Palace. An uncle of the Queen was shot for this by martial law, and the Queen herself was deposed on the 28th of February, 1897, and a few hours later was conducted to the coast on her way to banishment at Réunion.

One important alteration in the government of the provinces had a beneficial effect. The Hova Governors were dismissed and the several provinces were made

independent. In order to do justice to the principle of nationality among the numerous tribes, each province had to chose a native as Governor, to be subordinate to the Resident. In the same way the officers and local overseers were elected by the natives. The Betsileo province had its former independence restored to it, and so had the inhabitants of Sihanaka. The Betsimisaraka lands were broken up into two good-sized provinces, while the Antankara districts were formed into a northern province.

Former restrictive regulations as to the acquisition and renting of land were altered at the same time.

The administration carried out the principle of allotting estates up to the amount of 250 acres gratuitously to individual colonists, without the former demand for proof of capital.

In the purchase of larger estates no superior limit is fixed, the price of the hectare ($2\frac{1}{2}$ acres) has been placed at 5 francs on the eastern and 2 francs on the western side. The taxes in the colony are imposed in due proportion on the natives, without privileges for individual classes. These taxes serve to maintain the public requirements of the several provinces.

Justice is administered in accordance with the existing customs and notions of justice of the Malagasy. Instruction in the French language is made obligatory in the schools.

At the head of the Government of the Colony stands an Administrative Council of which the Resident-General is president. He is subordinate to the French colonial minister.

The Commandant of the troops, the Director of Public Works, the Director of Agriculture, the Director of Education and the Chief Justice are designated as members of the Administrative Council.

Besides the Court of Appeal in Antananarivo there

are Courts of First Instance in Imerina, in Tamatave and in Majunga. In addition to the Resident-General there are special residents in Fianarantsoa in Betsileo-land, also in Fort Dauphin, Majunga, Mananjari, Ambaton Drazaka, Antsirabe, Vohemar and Tolia. Governors, as they are called, are appointed for Diego Suarez, Nossi-Bé, and Ste. Marie.

The troops in the service of the colony consisted in 1896 of one regiment of Malagasy sharp-shooters, one colonial regiment and three battalions of marine artillery.

The diplomatic representatives are located in Tamatave and Majunga. The German Empire, Great Britain, Italy and the United States maintain consulates.

CHAPTER X

PRODUCE

THE western side, inhabited by the Sakalava, is of small fertility, and on this account no attempts at colonization worthy of mention have ever been made there. The soil suits cattle-raising better than agriculture, and this industry has been carried on very extensively by the Sakalava of Menabé because this district has abundance of fertile meadow land. In the south of the island there is a prevalence of miserable steppe land. The extreme north too is a wretched district, and I was astonished to find in the environs of Diego Suarez, which were described to me as a veritable paradise, nothing but a miserable desert.

In strong opposition to this is the condition of the eastern side; here the soil is almost everywhere well watered and of an astonishing fertility, begetting a vegetation of tropical abundance such as can be surpassed in few spots on the earth. To this is added the advantage that regions of very different altitudes are met with so near together as to be easily reached, one from the other.

In the north, it is true, the wooded mountains approach the sea only too closely, but from the locality of Tamatave southwards the coast belt becomes broader, and the plains fitted for tropical culture are thus more productive. Lastly, the Central Upland with its soil of reddish *löss* is bare of woods and moderately fertile; but here the Hova, by dint of industry and perseverance, have reclaimed the numerous valleys and dells of the

undulating country, and have laid out boundless rice-fields, the keeping up of which has been aided by the irrigation canals, in many places artificially constructed.

In general it must be emphasized that Madagascar not only produces everything that is necessary for the support of its population, but also provides an abundant surplus.

If we give closer attention to the agriculture of Madagascar we shall find that rice everywhere takes the first place among the objects of cultivation. A few tribes proceed in a somewhat primitive manner, as instead of hoe or plough they make use of oxen, which have to work the wet fields with their feet; the rice is then simply sown broadcast. The Hova, and still more the Betsileo, proceed with much more care, believing that rice never prospers well unless it is transplanted. They construct special terraces on the slopes of the valleys and sow the rice in the dry season. Artificial irrigation is then produced by collecting together the neighbouring streams. On many of the hills as many as a hundred green terraces, planted with rice, may be met with. When the rice plants are from 6 to 8 inches high they are taken out of the earth and planted in the paddy fields by the women slaves. This is done very quickly, but the magnitude of this industry may be estimated if we consider that, according to Sibree's account, westward from Antananarivo there extends a splendid rice plain 22 miles long and 10 broad. "When the rice is fresh planted, or when it is nearly ripe in autumn, it presents a glorious sight: the villages and the low red hills of clay rise like islands out of green waves or out of a sea of gold."

Nearly a dozen different varieties are said to be grown in the island. The white and the red are most frequently met with, the former being especially valued in the Central Province. The harvest is garnered in sheds.

In the interior two pounds of rice cost about a penny; at the coast it is of course dearer, owing to the cost of transport.

It is said to be of good flavour, and from certain harbours of the east coast, especially Mahela and Mahanoro, it is exported in large quantities. This export supplies



Madagascar agricultural labourers.

the neighbouring islands of Réunion and Mauritius, the Comoro Islands and Zanzibar, and even several districts on the East African coast.

The cultivation of cereals is unimportant, but on the

other hand, even in the distant forest villages we find the manioc, whose mealy roots, boiled or roasted, take the place of our potatoes; the roots of Saonjo (*Arum esculentum*) also form a favourite food of the people.

The cultivation of coffee has already made a satisfactory beginning, and ought to thrive now that France is desirous of making her colonial possession renumerative. The easily accessible mountain districts on the east coast are suitable for the coffee shrub in quite an especial manner.

More than ten years ago I found flourishing coffee plantations in the interior of the island, in the neighbourhood of the Betsimisaraka villages. The plants looked quite healthy and were richly covered with fruit. It would probably be renumerative for the French in Djibuti on the Somali coast, to take Abyssinian coffee plants from the neighbouring Harrar and to introduce this excellent quality into Madagascar. The coffee culture of the interior of Madagascar has hitherto escaped the plague of parasites, especially the ill-famed *Hemileja vastatrix*, which have been so destructive to the plantations of Réunion and Nossi-Bé.

The sugar-cane thrives very well and grows (in the land of the Sihanaka, for example) to nearly 12 ft. in height. The natives cut up the stalk into several pieces and are fond of sucking the sweet sap. A large sugar plantation has been laid out at the River Ivondro, in the neighbourhood of Tamatave. It is fitted with European machinery and is under the charge of a native of Mauritius. At present, indeed, the tropical sugar has a hard struggle in competing with the German beet sugar, but favourable circumstances might again arise, and in that case the fertile mould of East Madagascar would be eminently suitable for the cultivation of the sugar-cane, as indigenous labour might be utilized. It would be a pity if the manufacture of rum were to assume larger dimensions, as the Ma-

lagasy have already suffered severely from spirituous liquors, which they have great difficulty in resisting.

The cultivation of cotton is still in its infancy. The cotton tree indeed grows everywhere without cultivation, but it has the disadvantage that the fibre it produces is short and coarse. From 1886 to 1888 attempts were made with American kinds, especially "sea island", which decidedly promised to be a success. Sown in November, healthy plants were produced which bore ripe capsules after five months. After these were gathered, the cotton trees gave annual crops of a satisfactory character in the succeeding years. The produce attracted notice, and gained distinction in the agricultural exhibitions of Havre and Paris.

Recently attempts have been made to cultivate tobacco, using the best kinds from Sumatra and Cuba. The produce, as might be expected from the fertility of the soil, was thoroughly satisfactory as regards quantity. The size and delicacy of the tobacco leaves were remarkable, but there was too large a percentage of nicotine, and, besides this, the Madagascar tobacco was found to burn very badly.

This result does not sound very encouraging, but considering the importance of this article of trade, France might very well set about further attempts and endeavour to find soil of a more favourable character.

The cultivation of the cacao-tree seems to promise better, though it has only been attempted in a few scattered spots. The young plants require very careful treatment for the first few years; they do not become productive till the seventh year, but after that they give excellent results.

Vanilla, which is cultivated with so much skill by the Creoles of Réunion, ought to attain greater extension in the future on the east coast of Madagascar. Plantations are already laid out in Tamatave, which are in no way inferior to those of Réunion.

Madagascar is not poor in fruit trees. The citron grows wild, but its fruit has a somewhat bitter taste; the oranges, on the other hand, are of unsurpassed delicacy. They are largely exported to Réunion and Mauritius, but only keep for a short time owing to their thin rinds. The mango, of which there are numerous plantations, especially in north Madagascar, yields rich returns. Near Vohemar and on the islands of Ste. Marie and Nossi-Bé I saw groups of mango trees of a most picturesque appearance, and vying in size with the mightiest oaks of our forests. Although the flying foxes plunder the fruit every evening, the crop is produced in such a quantity that the over-plus is often used for feeding swine. Guavas, peaches, and even grapes are often raised, while the banana plantations frequently met with in the villages of the interior are especially productive. Quite small bananas are gathered side by side with the larger varieties. The largest of these, called *Ontsy*, is a foot in length. The fruit has a soft agreeable pulp and a light yellow husk with black spots.

The breeding of domestic animals is very important, not only among the Hova and Betsileo, but also among the Sihanaka and Sakalava of the west coast. It is, however, almost entirely limited to horned cattle. The rich grass plains are specially suitable for meadow land, and many graziers possess as much as a hundred head of cattle. Some rich natives have as many as two or three thousand.

The Madagascar cattle belong to the humped or Zebu kind. They appear to be somewhat low on their legs and the fat hump is of considerable size. The colour varies; side by side with milk-white and quite black cattle, beasts dappled with red are frequently seen. I have recently been endeavouring to ascertain their racial connexions and their descent, by examination of a good number of skulls, and am driven to the conclusion that

the Madagascar cattle were introduced from Africa, or at any rate that they were not brought with them by the Hova from their former island home near Southern Asia. The Hova found the cattle naturalized among the African tribes when they arrived in Madagascar.

We can distinguish two breeds; the cattle of the central and eastern part of the island with medium-sized horns, and the Sakalava cattle of the west with gigantic horns. The former breed has ascending horns, generally crescent-shaped, which may well be designated large; while the Sakalava breed has lyre-shaped ascending horns, turning somewhat backwards and of still more remarkable size. The Madagascar cattle have the closest anatomical relationship with the Sanga of Abyssinia, in which also there are two breeds.

The existence of the Sanga breed in Madagascar is all the more surprising at the first glance, because in the whole East Coast of Africa, from Somaliland to the Zambesi district, with a tolerably broad strip of land behind it, there are only short-horned cattle. The Sanga breed has only been supplanted in these regions during later times, for it appears from a discovery made in Upper Egypt by Prof. Naville, that Pharaoh's people brought back cattle from Somaliland together with dogs, giraffes and other animals, and that these belonged to the long-horned Sanga breed.

Cattle universally hold a pre-eminent position in the circle of Malagasy ideas. They are used as beasts of sacrifice at feasts, religious ceremonies, funerals, etc. They are made use of for labour in the rice plantations; the meat, which is uncommonly cheap (about a halfpenny a pound), forms, after rice, the most important article of food; the hides are carried by bearers to the coast; it is reckoned that 200,000 ox-hides are exported every year from the harbours of Tamatave and Majunga. The export of live stock is very important; the oxen are princi-

pally shipped at the two coast towns of Tamatave and Vohemar. At the former place the singular scene of ox-lading may be seen every week. The beasts are driven in herds to the landing-place, then forced with loud cries into the water, where they swim to the steamer and are hoisted on board.

The two colonies of Réunion and Mauritius, which have no cattle of their own, are quite dependent on Madagascar for their meat supply, and there a fat ox weighing some six hundredweight can be had for from 6 to 8 piastres (24—32 shillings). But West Madagascar also exports a good deal of live cattle, great numbers being raised by the Sakalava of Menabe. These supply Zanzibar and the East Coast of Africa, especially the Portuguese possessions.

When Diego Suarez came into the possession of France French capital had to enter upon a great undertaking, the object of which was to construct a meat reserve in Madagascar for the French army. The idea was an obvious one, as the flesh of the Madagascar zebu oxen is not only cheap, but uncommonly palatable. A preserving factory on a large scale was set to work in Antogobuta (in 1889) which slaughtered 250 oxen a day. The events of the war and other causes paralysed the activity of the undertaking for the time, but now that the whole island has become the property of the French, the work will probably be resumed in no very long time.

There are no sheep on the eastern side; they are mainly bred in the central province. These belong to the fat-tailed breed without wool, and were introduced from Africa. The flesh is dry and of poor flavour, but the skin can be turned to account.

Goats are kept by the Hova and Betsileo, occasionally also by the inhabitants of the west. The flesh is eaten with relish, the skins are principally sent to England.

Horses do not seem able to bear the damp climate.

An endeavour was formerly made to acclimatize them in Imerina, but the result was not favourable. This animal can scarcely be used with economic advantage on the soil of Madagascar, for the intelligent and docile zebu ox can be used for riding, and, besides, in the wet season the ground is too soft for a horse.

The pig is abhorred by the African elements as being unclean; it is not found, for example, among the Sakalava. Apparently this is an after effect of the Arabic influence in earlier times. On the other hand, it is to be seen wherever the Hova have settled, which is easily explained by the predilection for the pig on the part of the Malays. According to my observations, a blackish race has been bred up which is near to our Roman pig, and must at any rate be reckoned among the *Sus indicus* forms.

The only dog is a spitz-like Pariah dog, which has a great similarity to the dogs of Sumatra.

Poultry is to be seen in abundance. Domestic fowls are to be had everywhere in the market and are found even in the most wretched village of the primeval forest. Geese, ducks and turkeys have been naturalised.

Among animals of lower organization we have to mention the black bee and the silkworm.

Mining has remained till now somewhat undeveloped, because the former Hova government prevented all working of the precious metals, whether by natives or by strangers, and did not even allow itself to be won over by seductive offers of a share in the profit.

At several places the primeval rocks as well as the alluvium contain gold in quantities worth working, and gold is continually to be had privately from the natives, which must have been obtained clandestinely. Rich deposits of gold occur in the west at Mevatana, also in Ankaratra, at Lake Itasy and in Betsileo-land.

In 1886 the Hova government condescended to grant a concession to a French company for the exploitation

of gold mines in the west. A large establishment in Suberbieville, above Majunga, has been at work for a considerable time and has yielded favourable results. The auriferous rocks extend over a belt 30 miles broad and 60 miles long. Under the new conditions other deposits of gold in the interior will probably be attacked in the near future. The presence of silver, copper and zinc has been observed in various places. The wealth of the island in iron is very great, especially in Imerina, Betsileo-land and in the southern and middle parts of Sakalava-land. The natives have long practised the art of working iron ore, and they produce bars of pure iron, which is worked up by the native smiths into different useful articles.

Deposits of coal have been discovered in the north-west of the island, at the Bay of Passandava. The coal burns easily with a white flame and little ash. A certain d'Arvoy attempted to work these beds in 1856, but was forbidden by the Hova troops. It would be interesting to obtain authentic information as to the thickness of these coal strata, because the geological construction of Madagascar would scarcely lead one to expect extensive deposits of coal.

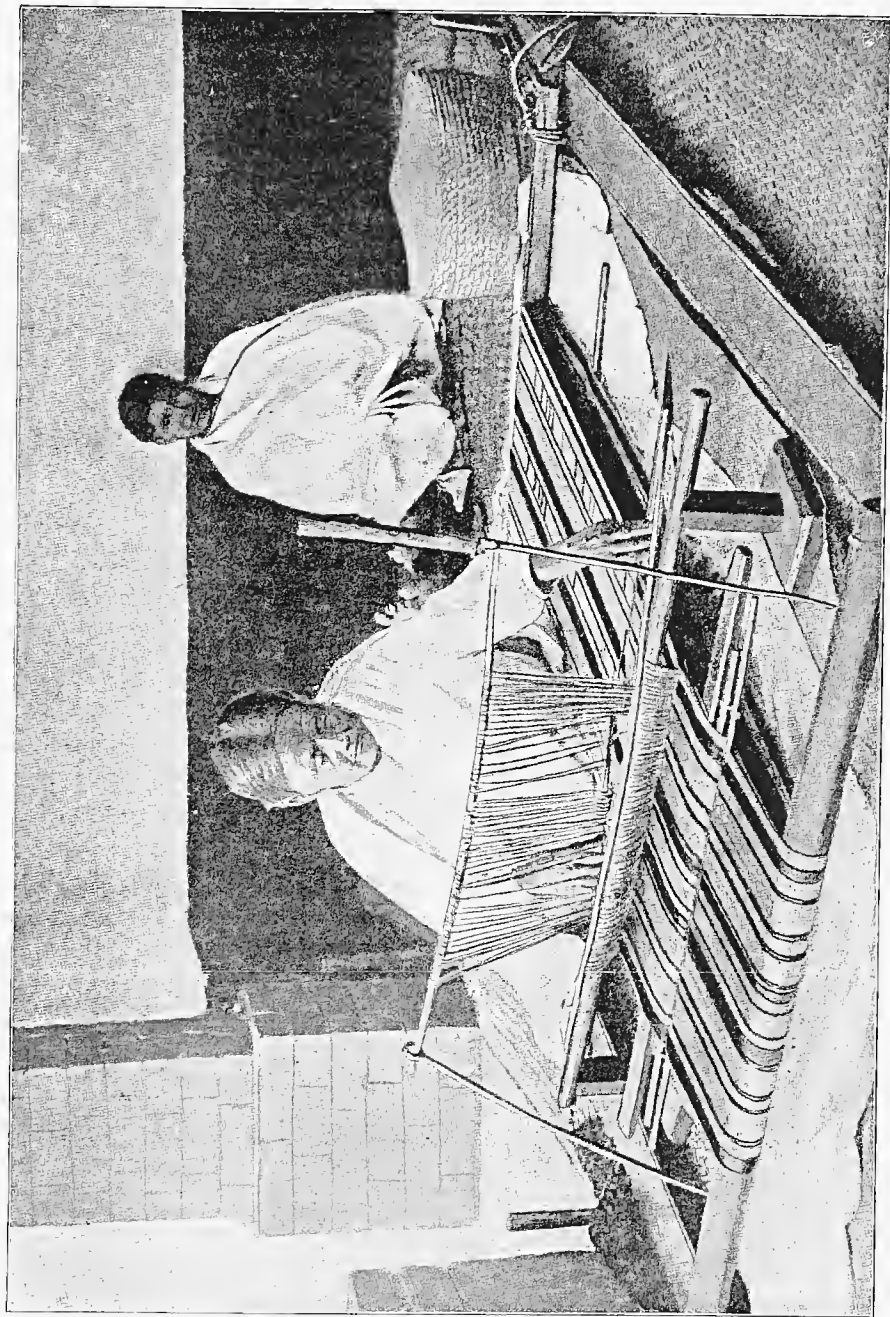
Slabs of gneiss for the Hova graves are obtained from the quarries, and for this a singular proceeding is adopted. Cow-dung is spread out on the stratified rock and is set on fire. After the rock has been heated for a long time, sudden cooling causes large pieces to detach themselves, and these are then carried by men to their destination. The burnt lime that they use in the interior is obtained from the deposits of lime in Antsirabe. On the coast they obtain it from blocks of coral.

Industry is on the whole but little developed in Madagascar. It is only in the Hova region that, under European influence, it has reached a somewhat higher level. First and foremost we may place the produce

of the loom, which shews remarkable skill on the part of the natives, and has suffered least in the singularity of its character. Different vegetable fibres are made use of—cotton, hemp and raphia-yarn. The latter supplies the palm cloths found throughout the island and very durable, which at present often make their way even to Europe. They are made from the leaf fibres of the raphia palm, by drawing an iron comb through the expanse of leaf and thus slitting it up; the palm yarn can be made of any required length by knitting the ends together. Then follows the colouring of the thread, for which the Malagasy use mineral dyes as well as fast vegetable colours. The loom is as primitive as possible, and the shuttle is a long piece of wood forked at both ends. Weaving is the duty of the women exclusively. The palm cloths (Raban-cloth) have generally dull colours—green, yellowish brown, brown and black. They are woven in strips, the pieces being generally 10 ft. long and 20 inches broad, with loosely tied tufts at the ends. The Europeans resident in the island use them as table cloths, curtains and the like; the natives make rough jackets, shirts and bags of them. The silken cloths, lambas and scarves woven by the Hova women in Imerina are very valuable.

Besides one silkworm, which has been introduced, Madagascar possesses indigenous silk-spinners which produce a very durable if somewhat coarse silk. Two species are known, *Bombyx radama* and *Borocera cajani*.

In the beginning of September I received numerous specimens of the webs spun by the Madagascar silk moths, large yellowish gray or light brown bags, reminding one somewhat of the nests spun by the procession moth of the birch or by that of the stone pine. This large cocoon contained from 80 to 130 hairy red-headed larvæ, which turned to pupæ in the interior of their wonderful cocoon, and in the winter produced tolerably large moths



Hova Woman at the Loom.
(After J. Silbee.)

of whitish colour with a brown spot at the tip of the anterior wing. The silk of this cocoon cannot be wound off, it is pulled away and the material itself is spun. The yarn is coloured light yellow, green, red or violet, and the cloths produced have polygonal figures woven into them. They are generally 10 ft. long and 5 ft. broad, and these gorgeous tissues are high in price. A fine lamba of silk fetches 20, 50 or even 80 piastres (about four shillings).

Another branch of industry in which the Malagasy display great skill, is straw plaiting. The numberless rushes and the stalks of the rice-plant supply a material, obtainable everywhere, from which hats, caps, napkins, mats etc. are plaited. By the introduction of coloured straws really tasteful patterns are produced. The chief market for straw goods is the city of Antananarivo, where they are often sold to supply the east coast.

The Hova artisans have an unusual aptitude for metal work. There are really good workers in gold and silver among them, who imitate European articles such as bracelets, chains, earrings, etc., with great skill; but under the former condition of things these people had no interest in cultivating their talent; on the contrary, they endeavoured to conceal it, for the Hova government used to take inordinate advantage of skill of this kind, and requisitioned their services without payment. The iron workers prepare lance-heads, knives, axes and similar articles, but they are of somewhat primitive workmanship. As bellows for the forges they use two upright cylinders in which the pistons are moved up and down alternately, similar to those in use in the Malay archipelago.

The workers in horn produce really beautiful work, which, it is true, is suggestive of a European origin; spoons, boxes, cups, plates, bowls etc. The large horn of the Madagascar ox serves as material. It is warmed over a gentle fire and cut into plates of different

thicknesses. These lamina of horn are pressed into wooden moulds in which they take the desired shapes—spoons, bowls and the like. The articles are brought to the market by Hova dealers.

Pottery and brick-making are more local, being chiefly practised in the central province. The goods produced are of somewhat indifferent quality. In Sakalava-land I found singular water-pitchers of rather tasteful workmanship, not unlike the Egyptian water-jars, but with a shining black covering of graphite.

There is yet to be mentioned the tobacco industry, the produce of which, however, is cheap and of very indifferent quality. The Hova is a passionate lover of tobacco, which he generally chews, carrying it about with him in a bamboo box. As he spits out the chewed mass on the floor of his dwelling without any ceremony, it is the custom on the arrival of a European guest, immediately to spread a clean mat on the ground—a real kindness.

The native has learned to smoke from the Europeans, and produces an exceedingly cheap kind of cigar.

Wood-carving with some idea of decorative art is most remarkable among the Betsileo, whose graves and memorial stakes exhibit ornamentations in a style of their own. Among the Sakalava I found carved wooden spoons with richly decorative additions, angular or round figures in which an African character could be recognized. The Hova are also making attempts at painting, for they adorn the walls of their village churches with representations of plants and animals, with a certain clumsiness, however, which often produces a comical effect.

The chase plays no part worth mentioning among the Malagasy, for whom a sufficiency of nourishment is afforded by cultivation of plants and raising of domestic animals. Larger game is not in general to be found on the island; the superstitious reverence for certain species prevents

the natives from putting them to death. The very palatable tenrecs, partridges and sultanias are mostly trapped. Many creatures are caught alive for amusement. The young Sakalava climb the trees with incredible audacity to catch the honey-suckers and parroquets, and are ready to supply any number of them at any time in bamboo cages. In the interior I saw the Betsimisaraka very busy catching cuckoos and kingfishers, but this was only for food. The numerous lemurs, including the babakota, are caught and tamed because they are pretty and tractable animals, but no economic use of any kind has yet been found for them.

River fishing on account of the numerous crocodiles is too dangerous to be carried on profitably. Among the Betsimisaraka I saw old women fishing; they formed a semicircle round a large pool and drove the fish into a wide net with all the noise they could make. The Sakalava, who are very bold on the sea, bring in many sea fish and crabs, and sea fishing is also carried on by the inhabitants of the east coast.

CHAPTER XI

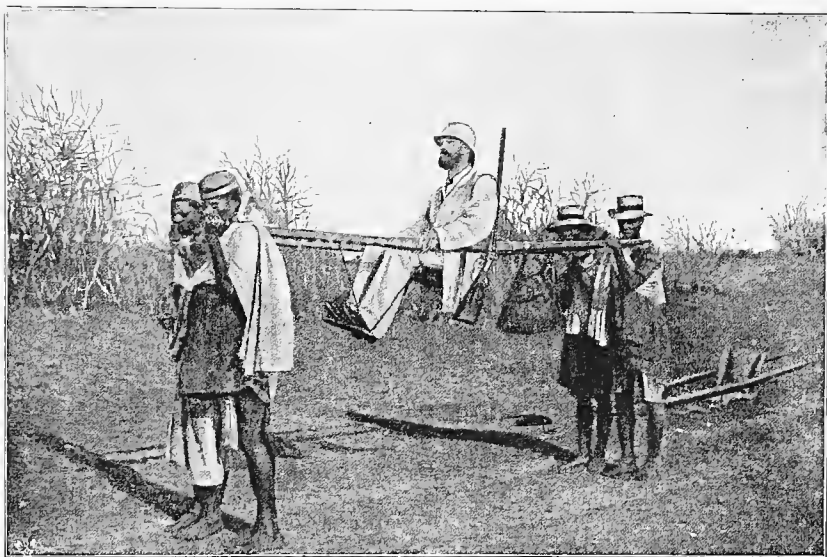
COMMERCE AND MODES OF COMMUNICATION

IN our still scanty knowledge of the island it is not easy to obtain trustworthy information as to the extent of the internal trade of Madagascar. This will not be altogether possible until the new colony enters upon a quiet period of normal development. In general thus much may be said with confidence, that the trade on the east coast will always be more active than that on the west coast. The Malayan element has a certain talent of its own for trade, and this trait of character is more remarkable among the Hova, who are more active than the heavy and somewhat indolent Sakalava.

Two restraining factors have hindered the development of a brisk local trade in Madagascar. First of all the absence of roads. For political reasons the Hova government hindered the construction of convenient country roads, being led to do so by the far from groundless view that the invasion of the Europeans would thus be made more difficult. The districts inhabited by African populations remained entirely without roads, because Africans in general have no inclination for making them.

Nowhere in Madagascar is a carriage to be met with. No horses or other beasts of draught are employed. Anyone who travels to the country either goes on foot or gets himself carried in a *Filansana*. This vehicle is in principle a carrying-chair firmly fastened to wooden poles some seven feet long; the foot-board, hanging down by cords, is used to put the feet upon when one does

not prefer to lay the legs on the poles or let them dangle freely. I saw Hova ladies of rank use a *filansana* that was somewhat different from this. The bearing poles consisted of bamboo cane; a basket of bamboo wickerwork, tolerably broad, but not very deep, and without a support for the back, replaced the chair. This basket, especially when lined with a soft covering, may give less fatigue on a journey of any length than



Travelling in a *Filansana*.

the narrow carrying-chair in which one can scarcely move. Four bearers take the ends of the poles on their shoulders and trot off in step. If one is going a country journey of any distance eight good bearers must be taken, who relieve one another at regular intervals. The substitutes slip under the poles with great dexterity in order to transfer them, and there is not the least jolt or interruption. For baggage again, special bearers must

of course be chosen. The people are indefatigable and easy-tempered, they have an accurate knowledge of the foot-paths, they choose their own quarters in the evening and always take good care that the customary hospitality is offered to the foreigner. It is better not to pay the bearers till the end of the journey, making no advances to them, but letting them meet all the expenses of the journey, and perhaps encouraging them with a glass of rum to keep them in good humour. The transport of goods in the interior is carried on exclusively by bearers, whose calling is easily recognized by their indurated shoulders. A man ordinarily carries from three quarters to one hundredweight. The burden is equally divided into two packets and fastened with raphia cords to a bamboo pole. The partitions between the segments are pierced with holes enabling the pole to receive the overall, some tobacco and other sundries. A load-bearer will cover 10 to 13 miles a day.

There is a special charm in travelling by water. A river voyage, in sight of the splendid vegetation on the banks, affords landscapes of most picturesque effect and is far less fatiguing than the seat in the filansana, which becomes somewhat uncomfortable after a time. Waterways are numerous on the east side, and are rather animated at certain times of the year, especially when the rice crop is being forwarded to the coast. The boat is a large dug-out some 30 ft. long, with five or six seats, which is impelled by oars shaped like a spatula. The vast primeval trunks furnish inexhaustible material for these dug-outs, for which the hollowed trunk of the varongy-tree (*Calophyllum inophyllum*) is mostly used. The regular movement of the oars is accompanied by soft and harmonious boat songs, or an improviser sings of the occurrences of the journey, with flattering allusions to the foreigner, especially as to his liberality. Sometimes the song stops of a sudden and there comes a sudden cry of

“Maff, maff!” which generally means that a crocodile has made his appearance in dangerous proximity. Rapids are overcome with great skill, but if there is no help for it, the boat is brought to the bank, unladen and carried past the rapids, where it again receives its freight.

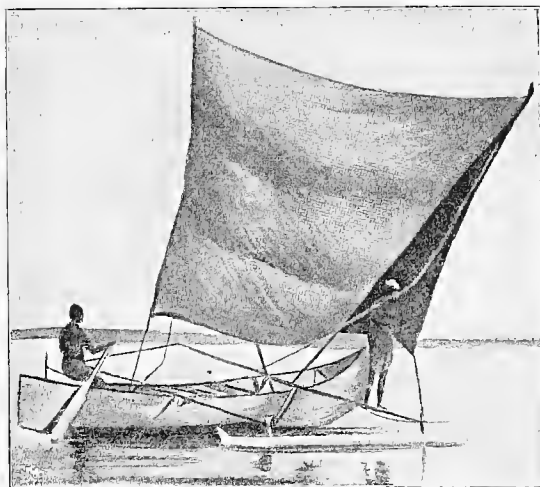


River-boat in East Madagascar.
(From the *Revue des Sciences*.)

In the south-east great wooden rafts called *sary* are used; in the south they employ boats of a still more primitive character, being simply bamboo rods tied together.

Vessels of superior build are used among the Sakalava of the west, as well as by the Antankara of the north;

these boats are always provided with outriggers, and even sails are applied to the coasting vessels. If the oscillations are too great they are moderated by placing a man on the extremity of the frame of the outrigger, from which he often gets thrown off. The Sakalava of the coast venture out into the open sea in these vessels. They are daring seamen, and used formerly to fit out regular fleets for carrying on piracy. The



Madagascar boat with outriggers.
(From the *Revue des Sciences*.)

Betsimisaraka of the east coast have also a predilection for the sea, and are glad to be engaged in the service of the European steamers and sailing vessels.

A postal and telegraph service had been established some ten years before the annexation of the island by the French. The larger places, such as Tamatave, Antananarivo, Majunga, Nossi-Bé, and Fianarantsoa had special post-offices and received or sent off news by

special messengers. A telegraph line between Tamatave and Antananarivo was completed in 1887.

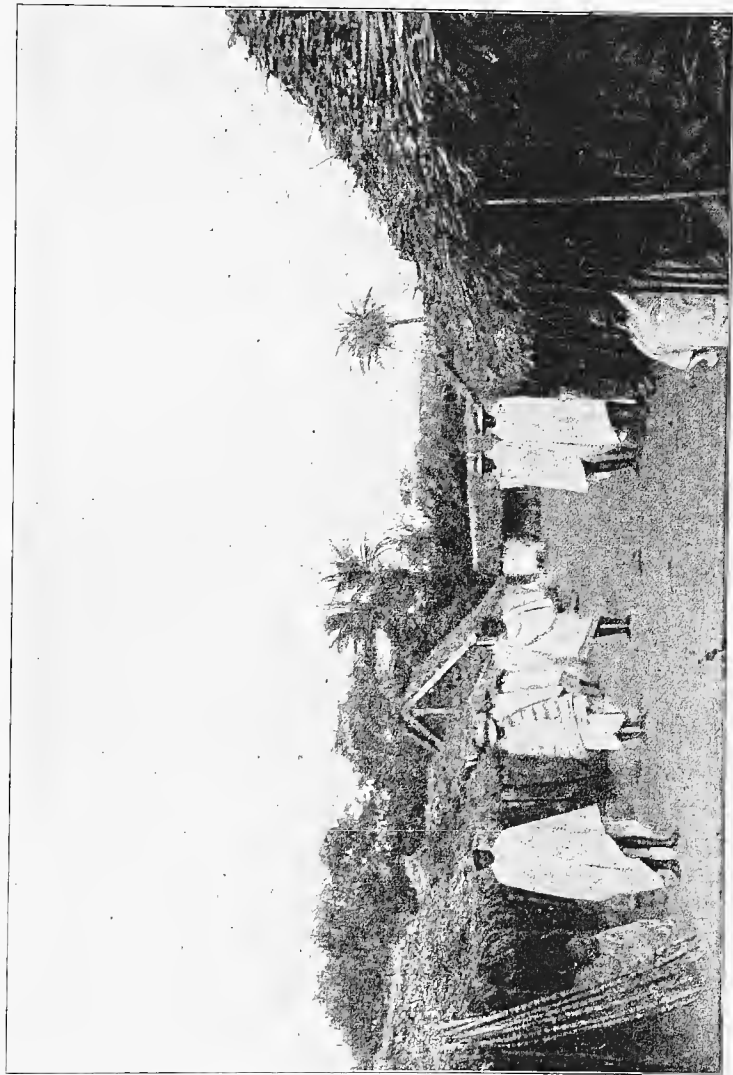
The communication of Madagascar with the outside world is carried on regularly by European lines, and although the coast is not rich in harbours it affords good anchorage. The island is most easily reached by the steamers of the *Messageries maritimes*, which sail every month from Marseilles by way of Suez to Aden and Zanzibar, and then call at Mayotte, Nossi-Bé, Diego Suarez and Tamatave, Réunion and Mauritius. The English "Union" and "Castle" lines supply means of intercourse between the Cape and Tamatave on the east coast, by way of Fort Dauphin. Other means of transit by sailing ships and small coasting vessels present themselves at irregular intervals.

Since the commencement of the last Franco-Malagasy war Madagascar has even gained admission to the network of submarine cables, a cable costing 3,000,000 francs having been laid from Majunga to Mozambique.

One circumstance has often paralysed trade in Madagascar—namely, the want of any generally recognized coinage. Formerly, indeed, only French five-franc pieces found acceptance everywhere, but there was no small change. In its place came "axe money"; the five-franc piece was broken up with a hatchet into several pieces, (as many as sixty) and these pieces were used as money. Purchases were thus very tedious; if one wished to take a journey into the interior it was necessary to provide one's-self with a quantity of "axe money", as well as weights and scales, the native dealers being very particular as to the precise weight of the pieces of silver. This inconvenience will gradually disappear under the new arrangements.

The productiveness of the island can doubtless be enormously increased under proper management, but as yet the export trade has not assumed any great dimen-

sions, and has even suffered serious disturbance by the wars of the last two decades. Among articles of export belonging to the animal kingdom, live stock plays the most important part. The great wealth of the island in cattle has been already emphasized. As the adjacent colonies of Réunion and Mauritius chiefly grow sugar and coffee and possess no meadow land, they are dependent on Madagascar for their meat supply, as are also certain strips of the East African Coast. Sheep, pigs and poultry are likewise exported, and the Hova formerly placed export duties on them. In Tamatave the Hova custom-house exacted 15 francs for an ox, 2 fr. 50 c. for a pig, the same amount for a dozen geese, and 80 centimes for a dozen fowls. The most important export of hides was at the two coast towns of Tamatave and Majunga. Among vegetable articles exported, caoutchouc is of special importance. It comes to market in black balls as big as a man's head. From $2\frac{1}{4}$ to $2\frac{1}{2}$ francs per lb. is paid for it in Tamatave. The natives get it from the caoutchouc liana (*Vahea madagascariensis*) which is frequent in the forest region. They make an incision in the stalks where they are of the thickness of the thumb and collect into vessels the sap which exudes. The sap is made to run more quickly by the application of citric or sulphuric acid, and it has at first a pale pink colour. It is then made into balls and blackened with smoke by being preserved in the huts. As the liana is of tolerably rapid growth and the demand for the produce is continually increasing, regular plantations of the caoutchouc liana in the forests by the coast might yield good profit and be of great importance in the future. So long as the condition of the law under the Hova government failed to give the necessary feeling of security, so that it was impossible to establish large forest farms, the enterprise of capitalists was unable to engage in extensive caoutchouc culture. Unfortunately, the want of care on



Bazaar in Tamatave.

To face p. 142.

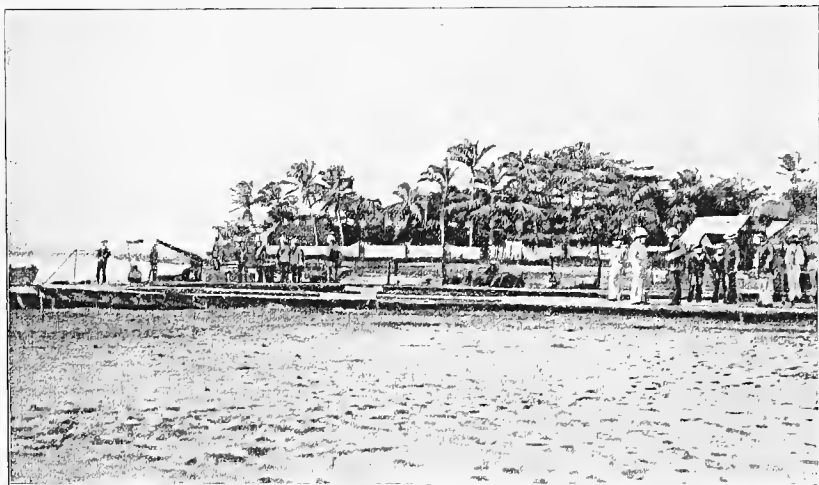
the part of the natives has injured many of the liana or impaired their productiveness, as they not merely make incisions in the slender trunks, but cut them completely through.

In the south of the island caoutchouc is obtained from the euphorbiaceæ of the forests and is exported almost exclusively by way of Fort Dauphin. From oral information furnished to me by a European resident, the yearly produce was very important, but, on the other hand, this source for obtaining caoutchouc has almost entirely come to an end in consequence of the exhaustion of the trees. The total export of caoutchouc from Madagascar amounts to from 4 to 5 millions of francs annually.

Raphia fibre has for some time formed an important article of export. As there are whole forests of raphia palms the speedy exhaustion of this product is not to be anticipated. The fibres are obtained by slitting up the very long fronds. On account of their durability our gardeners use them for tying up plants, and in the wine-growing countries for the vines. On the coast they are sold for 20 francs the hundredweight, but as they take up a good deal of room their price is greatly increased by the cost of transport to Europe. There is a tolerably large export to Réunion and Mauritius of raphia bags worked by the Malagasy. These are used for packing coffee and sugar. The striped raphia cloth is chiefly exported to France, where it is esteemed for covering furniture and is occasionally used for curtains. The export of rice, the most important product of Madagascar, has been already mentioned. Maize is but little cultivated and has not yet been noticed as forming an article of trade.

Formerly a good deal of copal was procured in the coast regions; at present the quantity has diminished, but the export still amounts in Tamatave to some 40,000 francs annually.

As the Malagasy have adopted many European requirements the import of foreign goods has gradually mounted up. Among articles of consumption we must give the pre-eminence to salt and rum. The former is brought from Hamburg and Marseilles to the east coast, while the rum comes chiefly from the island of Mauritius. The manufacture of this alcoholic drink has greatly increased in consequence of the sugar crises, and so has the demand



Landing-stage at Point Hastie in Tamatave.

for it in Madagascar. In the most wretched village of the east coast, where it is perhaps impossible to hunt up a piece of meat or a couple of eggs, a sufficient supply of this drink is always to be found. The Hova kept it away from their district as much as possible, and it is to be wished that its importation may be made more difficult for the tribes of the east coast, for they have already suffered severely from the immoderate consumption of rum.

Beer, wine, and preserves find customers in the European residents.

There has been for many years past a strong demand for clothing materials. Chief among these is the white calico used for overalls (*lamba*). This is generally of American origin, and is manufactured in Boston. Cotton prints are also largely brought in, as they are worn by the women and are consequently exposed for sale in all the shops of the coast villages. The colours are different for the different tribes,—the Hova, for example, prefer small designs in rose colour; the Sakalava women, on the other hand, like large-flowered gay patterns, while other tribes take only blue stuffs. In the cooler highland regions flannels are somewhat eagerly sought after, while silks find but a limited sale. Glass, boots and shoes, clocks and bijouterie only find sale among the Hova, and even with them the price must be kept as low as possible.

European tools are in small request, while cast-iron cooking-pots are to be met with in almost every house. Among musical instruments the accordion is largely imported, the Hova liking the hexagonal shape, while the coast tribes, especially the Sakalava, prefer the rectangular accordion.

Houses of trade of considerable size have been established in Tamatave and Antananarivo—English, American and French firms; in Nossi-Bé a Hamburg firm has obtained great influence and rules the trade with the Sakalava coast. There is also a Swiss house of business in Fort Dauphin.

Retail trade is carried on among the coast towns by natives or by Creoles from Réunion; the latter, however, are a very untrustworthy lot. On the other hand, Hindoo traders, on account of their thrift, are often trusted by the wholesale merchants with goods on credit, which they dispose of even in the interior. The Arab traders have only been able to maintain a footing on the west coast.

It is not easy at present to determine the total amount of the trade of the island of Madagascar, and it will not be possible till the new colony is fully regulated. The last few years have not been normal, on account of the state of war. The earlier statistical reports of the Hova officials, under a custom duty of 10 % in money or in kind, can raise no claim to be depended upon. In addition to this the English missionaries used of old to introduce important consignments free of duty. We shall perhaps come near the truth in setting down the yearly trade at from 30 to 40 millions of francs.

In the roadstead of Tamatave, the most important place of trade on the east coast, there appeared during 1850 a total of 255 merchant vessels, among which 39 were French, 183 English and a few German.

The total imports at the port named were distributed as follows: Woven stuffs 66 %, Drink 13 %, Provisions 3 %, Ready-made clothes 3 %, Groceries and Hardware 2 % each. From the first official report on the Imports of Madagascar, that for the year 1896, published by Gen. Gallieni, we learn that, in spite of the then still insecure condition of the newly conquered country, they amounted to a total of £511,507. These imports were mainly contributed as follows:—

England and her Colonies	£229,992
France	„ 131,228
America.	„ 99,470
Germany	„ 27,514
Norway	„ 3,664
Switzerland and Denmark	„ 649
Spain and Portugal	„ 180

Cotton stuffs and other woven goods were introduced to the amount of £250,000 in 1896, of which £150,000 are credited to England and India, £86,000 to America and £12,600 to Germany.

CHAPTER XII

TOWNS AND VILLAGES

It is not easy to survey the chorography of the island and its underlying laws in full detail, because wide districts have been inadequately explored and several regions remain quite unknown. Even half-trustworthy statistics of the population will for a long time have to remain a desideratum.

Nevertheless, noteworthy points in the relative proportions of the population can be brought forward as isolated facts, and can be explained on anthropological, political, topographical and climatic grounds.

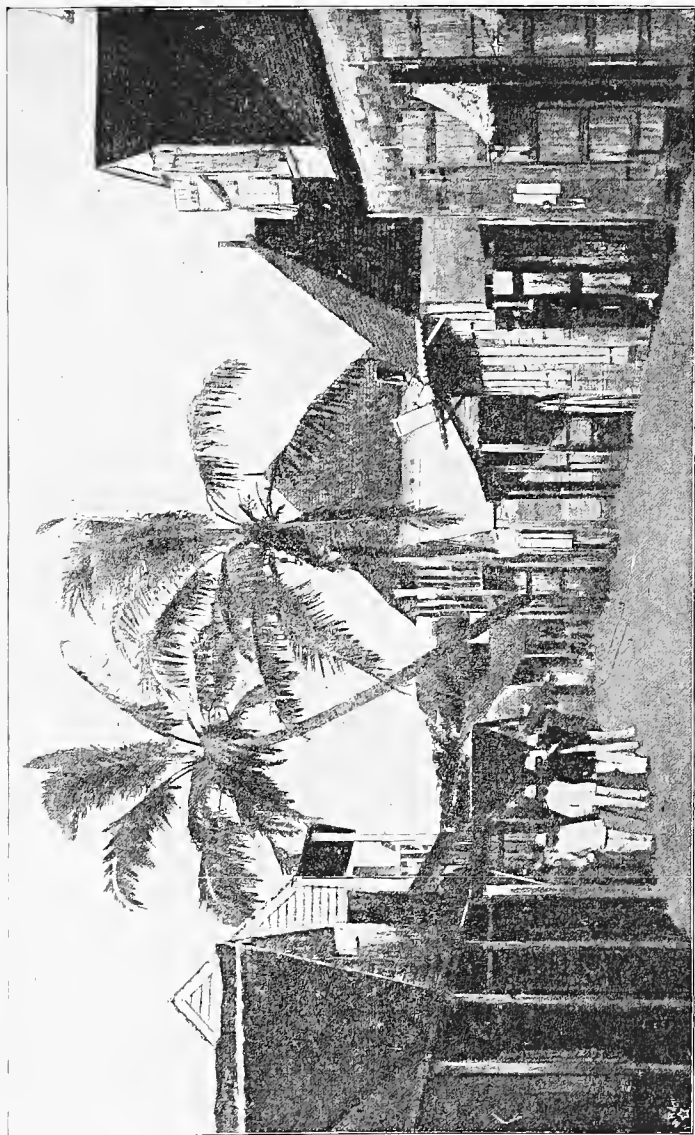
In the first place we are struck by the fact that the density of the population is not greatest in the easily accessible fruitful zone, but in the centre of the island, where the productiveness of the soil appears to be less. Here several populous cities have grown up, as Antananarivo with more than 100,000 inhabitants, distant 190 miles from Tamatave and 280 from Majunga. This city is built on a hill which rises from a wide plain as an isolated mass. On the highest point stands the former palace, where the Kings and Queens of Madagascar resided. The city of Ambohimanga, 27 miles from the old royal residence, was at all times looked upon as a sacred place by the inhabitants. The capital of the Betsileo province is Fianarantsoa, the trade of which is not inconsiderable.

Two millions of Hova and Betsileo live on a relatively small area in the highlands, while in the lowlands we are often astonished at the rarity of large villages.

This condition of things is explained by the contrast between the races. At the beginning of the settlement evidently only the belt of coast that was peopled, and it was this was by African tribes. The Malays came to Madagascar at a relatively late period and in a minority. The popular traditions which still exist, point to the fact that the newcomers were not received in the most friendly manner; later developments must have induced the Malayan population to settle in the then unpeopled highlands, where their industry and perseverance made the soil productive. The cooler air was obviously a favourable factor, giving them preponderance over the coast tribes, exposed as they were to fever. In spite of the barbarous judicial proceedings and the frequency of infanticide, the Malayan element must have greatly increased throughout a considerable period. At the commencement of this century the city of Antananarivo counted only 10,000 inhabitants; in the next forty years its population increased to 20,000, and since then it has multiplied itself more than five-fold. The importation of slaves does not suffice entirely to explain this phenomenon.

The contrast between the races has not tended to become obliterated in course of time, but has become more and more marked. With the numerical increase of the Malayan element came the strengthening of its political influence, till finally the Hova became the ruling race. The Hova, however, have been quite unable to found colonies of any size in the coast lands. In the north, in the land of the Sihanaka, an amalgamation with the African element does seem to have taken place. The Sakalava of the west have kept themselves strenuously apart.

The lower forest region lying next to the mountains and surrounding the island with a girdle of varying breadth, has never been favourable for a productive settlement, for here even the wretched forest villages



Street in Tamatave.

To face p. 148.

are extremely few and far between. The primeval forest, imposing as it is, is an element hostile to man, for it denies him the barest necessities of life.

Whatever serviceable thing the forest produces is at an inaccessible height. The ravenala, whose foliage is in such demand for the roofs of dwelling-houses, can never be got at, and recourse is had to the langozy plant, a species of ammonum, for covering the huts.

In the lower region as far as the coast, lives the oldest stratum of population. This consists of negro tribes of African origin, though intermixed locally with foreign blood. The somewhat fair Betsimisaraka of the east coast cannot be reckoned among the Asiatic immigrants, as is sometimes done.

Contrasts of climate bring about differences of economic conditions and thus have led to marked differences between the eastern and western sides of the island in the mode of settlement of the people.

The west coast bears the stamp of steppe land. In the south it passes here and there into a barren waste of sand. By this the only suitable occupation is indicated beforehand, and nature itself prompts to cattle-raising and a nomadic life. According to existing information, which is still very imperfect, the population is of small density, though Menabé appears to be somewhat more populous.

The places on the coast are unimportant, in spite of the numerous bays, some of which offer excellent protection. The propensity of the Sakalava for shifting their place of abode may have been the chief reason that this western side, facing the African coast and easily accessible, has given rise to no towns of any large size.

It is known that about the middle of this century Sakalava migrated in numbers to Nossi-Bé in order to be politically free. Even the Comoro Isles and Zanzibar served as goals to this emigration. Every year the whole



The Village of Mahasoa in East Madagascar.

male population, in some places at any rate, leave their native villages to seek for new pastures. The Sakalava of Maintirano live throughout half the year on the coast; the other half, namely the rainy season, they spend on the Island of Juan de Nova, where they occupy themselves in planting maize and catching turtle. Formerly this love for a wandering life was expressed in a very inconvenient manner, for the Sakalava fitted out pirate fleets and made the Mozambique Channel insecure.

The reason that the single important town in Sakalavaland, namely Majunga, has attained some importance is that the great river Betsiboka empties itself into the sea at this place and forms an artery for trade with the interior.

Things are essentially different on the east side. Here the extreme fertility of the soil impels the settlers to agriculture, for which the negro had from the beginning a natural gift, whereas his liking for cattle-raising was a secondary one, adopted first from Hamitic races. Agriculture presupposes a settled mode of life. The east side surpasses the west in density of population, but might support ten times its present population without difficulty. On the coast lie numerous and to some extent flourishing towns, the rise of which is, for the most part, connected with the rapid expansion of trade in the neighbouring islands of Réunion and Mauritius, with which a brisk intercourse has always been kept up. The great increase in the inhabitants of Diego Suarez in the north was accidental, and arose from the fact that ten years ago it passed into French hands. Vohemar owes its existence to its convenient harbour and healthy climate; it is an important harbour for the export of live stock. That the city of Tamatave has become the most important centre of trade on the east coast is explained by its advantageous geographical position between the Mascarenes and Central Madagascar. Large villages have

arisen towards the south with plentiful traffic, such as Mahanoro and Mahela, because these places have a very productive hinterland, and the shortest and most convenient route to the coast for the conveyance of agricultural produce, especially rice, passes through them.

As there are in Madagascar neither roads nor suitable transport animals, it is inevitable that the numerous rivers on the east coast should have a strong influence on the settlements in the interior. River-navigation is highly developed here, and it is along the course of the rivers that the villages of the Betsimisaraka are chiefly to be found. These are always erected on elevated places, that the abundant tropical rains may flow off rapidly. The lower course of the rivers is short, rapids or waterfalls make it impossible for ships to pass into the mountain region, and a strikingly large settlement is always to be found just above a waterfall. This serves as an emporium for the produce from the interior—namely, rice and coffee. Here the native Creole traders make their purchases and load their boats with the goods that they bring down the river to the coast.

CHAPTER XIII

SMALLER ISLANDS OF THE TYPE OF MADAGASCAR

VARIOUS smaller islands are grouped near the colossal island which we have described. These are partly of volcanic origin, and partly small outlying pinnacles of the central rock.

The climatic conditions agree with those of Madagascar, except that the contrast between the wet and dry seasons is more sharply marked than on the main island.

The flora and fauna are not so rich in species, but are of pronounced Malagasy character, though isolated endemic species are also to be met with.

I. SAINTE MARIE

This small, flat island stretches along the eastern side of Madagascar, from which it is distant only $4\frac{1}{4}$ miles, and is crossed not far from its southern point by the 17th parallel. Its surface contains 60 square miles, its length over 30 miles. The south and west are fringed by flat banks of coral.

The harbour of St. Louis on the south side is roomy and well sheltered; it can be reached by steamer from Tamatave in seven hours.

The climate is considered very unhealthy on account of its dampness; the vegetation is of astonishing luxuriance. In the interior are to be noticed extensive forests,

which the Colonial Government is turning to advantage for shipbuilding.

The number of inhabitants in 1888 amounted in round numbers to 7600. They are almost exclusively Betsimisaraka, coming from the opposite coast. They call the island Nossi-Ibrahim, *i.e.* Abraham's Island, and are said to look upon themselves as descendants of a Semitic race. Their physiognomy, however, does not support this hypothesis; it is far more probable that the name of Nossi-Ibrahim is to be traced to Arab traders settled in the island in former times. The inhabitants of the island are fond of a seafaring life; they readily take service in manning the French steamers, and are considered capital sailors.

The formal occupation of Ste. Marie was carried out in 1821 by Sylvain Roux, then trade agent of Tamatave. The English soon afterwards made a protest, and an English corvette appeared before the island to obtain explanations from the French as to their intentions, as England could not recognize the claims of any European power upon the region of Madagascar. Sylvain Roux thereupon entered into closer relations with the tribes on the east coast, and an alliance with France was announced in 1822. However, King Radama I. appeared with some troops, attacked the allied tribes and imposed such strict regulations upon the trade with Ste. Marie that the colony was on the point of giving up its undertaking. An expedition fitted out by Heyde de Neuville restored the earlier state of affairs in 1827. By a decree of Oct. 27th, 1876, Ste. Marie was placed under the government of Réunion.

The fertile shore of the island is favourable for the cultivation of sugar-caness and coffee, and the cultivation of vanilla has been introduced by the Creoles; lately an attempt has been made to plant caoutchouc lianas in the woods.

2. NOSSI-BÉ

"Nossi-Bé" (literally "Great Island") is in reality a small island, rich in natural beauties, situated in the Mozambique Channel. It is only 116 square miles in extent, and is close to the north-west coast of Madagascar. The island lies between $13^{\circ} 10'$ and $13^{\circ} 24'$ S. latitude.

In shape it is an irregular quadrilateral. There are considerable bays in the south, east and north; the greatest length amounts to 16 miles, the breadth to $9\frac{1}{2}$ miles. Still smaller islands emerge at a greater or less distance: thus Nossi-Cumba in the south forms a conical mountain mass, which is made use of by the Europeans as a summer residence, on account of its salubrious air. Further out to sea one perceives Tany Kely, an uninhabited islet which serves as a safe asylum for the large bats; towards the mainland are seen Nossi-Faly and Nossi-Mitsiu, while the island of Sakatia lies close to the west coast.

Nossi-Bé is mountainous; the most important elevations lie in the middle, where Tany Latsaka rises to 1600 feet; a second mountain group is found in the north, and a third in the south-west, where the granite cone of Lokubé, covered with dense forest, is 1500 ft. in height.

The geological structure is somewhat complicated, but volcanic formations, trachytic and basaltic rocks predominate. The volcanic cones are all extinct and conceal circular crater lakes, nine in number. Signs of former volcanic activity are to be noticed in the hot springs on the left bank of the Djabal-river, which were discovered in 1849. According to the analysis of Dr. Herland they contain lime and sulphur; the water has a temperature of 111° F. The mass of Lokubé consists of a coarse-grained granite, resting on a dark slate whose

strata are greatly inclined. There are also tertiary lime deposits, and in the coast region I was able to observe recent shell-breccia and coral formations, but only of small extent. The island is well watered, being full of streamlets; among rivers only the Djabal and the Andriana are worthy of mention.

The climate is considered hot; according to the statement of Dr. Völtzkow, the minimum temperature from June to December was 70° F. and the maximum 80° F.

Plant life is of quite tropical luxuriance. The mango-trees and lebbek-acacias form picturesque groups in the neighbourhood of human dwellings; cocoa palms flourish excellently, the ravenala spreads its giant fans in the forest, and the crater lakes are fringed with raphia palms. Mangrove trees form their dense groves in the bays.

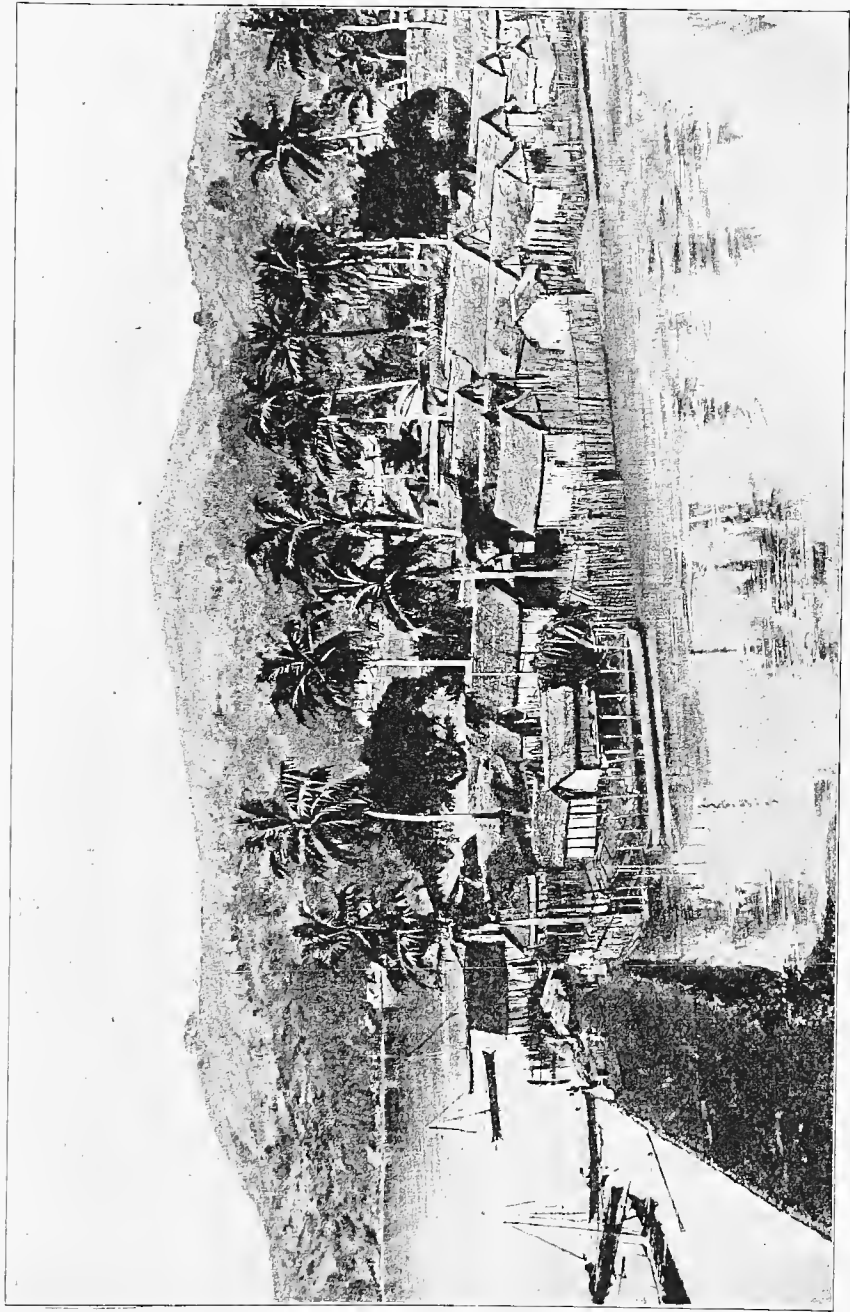
The animal world is almost as rich as in Madagascar. Honeysuckers chirp round the forest trees; the long-tailed fly-catcher (*Terpsiphone mutata*) finds its home in great numbers in Nossi-Cumba. When I saw it, Lake Djabal was alive with rails, waterhens and bee-eaters.

Among mammals a black maki (*Lemur niger*) is common in the forest of Lokubé; in the twilight the fruit-trees swarm with flying foxes (*Pteropus Edwardsii*) which regale themselves on the soft fruits.

The population of Nossi-Bé has suffered great diminution of late years. In the fifties it amounted to 15,000 inhabitants, in the eighties it was about 9000, and at present it would be even somewhat less.

The European element consists of officials, and of French Creoles who carry on trade and possess plantations. As the seat of Government was removed to Diego Suarez in 1886 the number of Europeans has of course diminished.

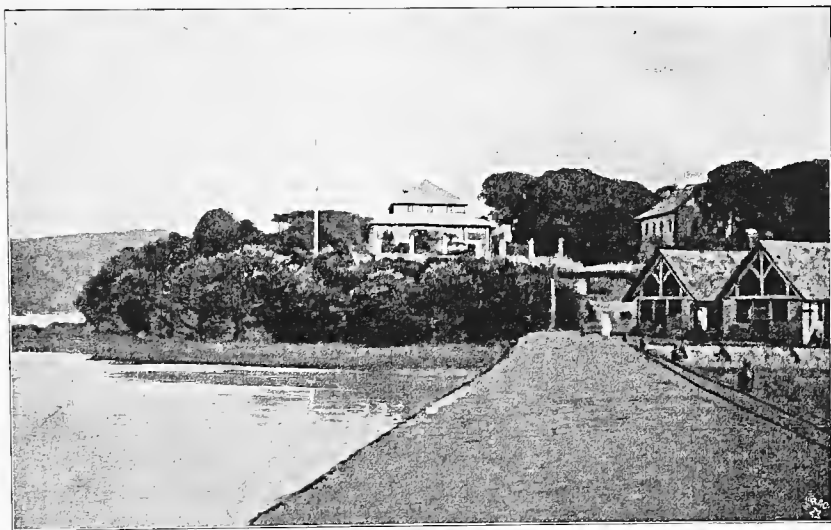
The mass of the inhabitants consist of Sakalava, who have immigrated from the west coast of Madagascar; then there are African negroes who carry on the labour



Andavakoloko on Nossi-Bé.
(From a Photograph by Dr. A. Voltzkow.)

of the plantations, which the Sakalava could never be brought to do; we also find Hova occasionally, besides Hindoo and Arab traders:

Even Comoro islanders from Johanna have made their way here; they are cunning and averse to labour, but are popular as jesters. They are in the habit of performing their dances in the evening; they



Helville on Nossi-Bé.

usually live at the cost of their good-natured Sakalava wives, whom they have married in order to be supported by them.

The busiest spot on the island is Helville, with its European buildings. It lies on a flat elevation in a charming situation beside the wide roadstead and opposite to the mighty mass of Nossi-Cumba. To the west are dimly seen the ruddy hills reaching to Cape Finaloa; in the east is the slope of the forest of Lokubé.

Nossi-Bé has become the centre of trade with the Sakalava coast.

The imports, consisting of cotton, glass, fayence, musical instruments, spirits etc., are remarkable. The amount of trade in 1893 was nearly £200,000, of which £100,000 were for imports and £95,000 for exports. France is only credited with £14,000 of the imports. The retail trade is carried on by Arabs and Hindoos, dwelling chiefly in Ambanuru, who can get good credit from the wholesale merchants, while the Creole dealers are quite untrustworthy. At the present time both import and export trades are principally in German hands, a Hamburg house having a flourishing factory on Nossi-Bé.

3. THE COMORO ISLES

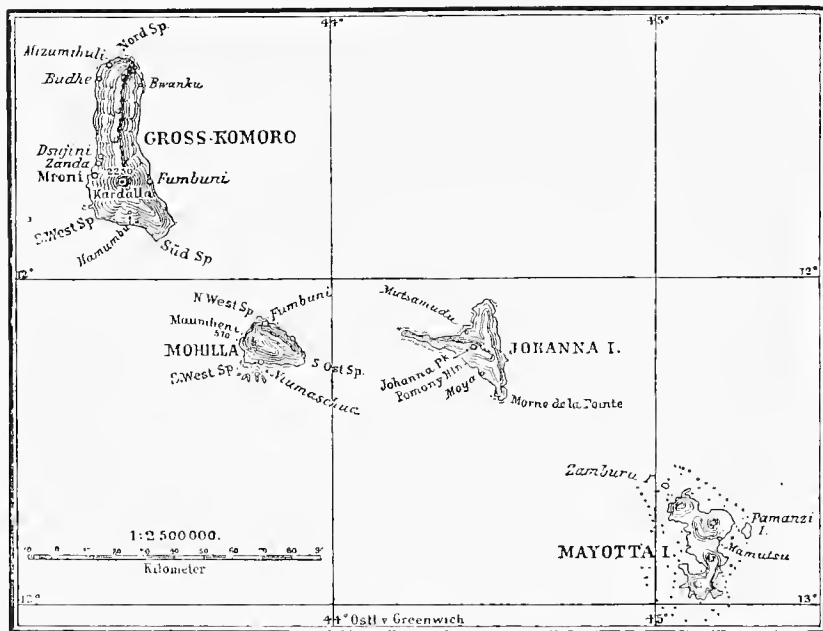
This singular group of islands, lying in the north of the Mozambique Channel, between Madagascar and the African continent, and extending from 11° to 13° S. lat., consists of the four islands—Mayotta, Anjuan or Johanna, Mohilla, and Great Comoro or Angasija. The total area amounts to 770 square miles, of which 390 fall to the share of Great Comoro.

The islands are exclusively of volcanic origin; neither primitive rocks nor sedimentary formations have been shewn to exist there. The edge of the coast, on the other hand, displays extensive coral reefs. Darwin remarks, in his work on the distribution of coral reefs, that Mayotta is surrounded by a barrier-reef from 3 to 6 miles distant from the land. There are many breaks in the circuit, and the channel within the reef is from 36 to 38 fathoms in depth.

A coral barrier is also mentioned on the south-east side of Johanna. Mohilla seems likewise to be surrounded by a reef, but there is a harbour on the southern

side. The coral formations on the coasts of Great Comoro, however, appear to be of less extent.

The Arab traders dwelling on the east coast of Africa have known these islands for a long time, and have transferred to them the name "Komr", formerly applied to Madagascar, and from this came the name "Comoro Islands".



Map of the Comoro Islands.

The French took possession of Mayotta in 1841. When trouble arose with the Hova government in the eighties, followed by a delusive peace, the other Comoro Isles were placed under French protectorate, in 1886, in order to shew at least one success in foreign matters.

The climate of the islands is warm, but is easily borne by Europeans, as the prevalence of the trade-wind prevents stagnation of the air. The dry cool

season lasts from May to October; the temperature ranges between 68° and 84° F., and the winds constantly blow from the south-east. With October begins the hot rainy season; the temperature rises from 77° to 95° F., the prevailing wind blows from the north-west. Great Comoro has no permanent streams, in spite of its abundant rainfall, as the water trickles away into the porous volcanic rock, and it is only on Mayotta, Mohilla and Johanna that streams, and these of no great size, flow throughout the year.

The volcanic soil generates a very luxuriant covering of vegetation. A great part of it was formerly covered with forest, but with the increase of the population it has been more and more brought into cultivation. Fine gardens and large plantations are met with in the vicinity of the towns; there is much cultivation of rice in the low-lying situations; cotton grows wild everywhere, but does not seem to be made an object of industry. The flora has a Malagasy stamp.

This holds also for the animal world, although several endemic species occur. Among the lemuridæ *Lemur mayottensis* is peculiar to this region. The flying dogs or flying foxes (*Pteropus comorensis*) attain a remarkable size. The Madagascar tenrec is found as far as the Comoro Isles.

There were formerly many swine in Mayotta that had run wild, but they are now extirpated.

Among birds, the kites and ravens (*Corvus scapulatus*) are uncommonly obtrusive in the neighbourhood of human settlement. Black parrots are also indigenous in the islands. Insects are fairly numerous. The purse crab (*Birgus latro*), which I have also met with frequently in Nossi-Bé, is worth mentioning.

The population of the group of islands embraces some 47,000 souls, 20,000 of whom live in Great Comoro, 12,000 in Johanna, 9000 in Mayotta and 6000 in Mohilla.

We have evidently to do with a mixture of Swali, Arabs and Malagasy. In Mayotta the Malagasy element is predominant, while the remaining Comoro people incline more to the Semitic type and are apparently crossed to a great degree with Arab blood. The oldest immigrants may have come from Usambara. Mayotta was the latest settled; this was about 650 years ago, and almost simultaneously by Sakalava from Menabé and by people from the other Comoro islands.

The small princes or Sultans are chiefly of Arab origin and hold strenuously to the precepts of the Koran. In the thirties a Malagasy named Ramanteka reigned in Mohilla. He was of the family of Radama and must have fled from Madagascar. After his death his daughter Djombi Fatombi was raised to the throne. In earlier times untrustworthy travellers passed unfavourable judgment on the inhabitants of the Comoro Isles, but in contrast with these Baron Claus von der Decken draws a very sympathetic picture of them. He describes them as harmless, gay people, often spending the whole of a moonlight night in dance and music. Their stature is on an average extremely powerful "so that one gazes in sheer amazement at the Herculean stature of these Colossi." Their language seems to be related to the Swali dialect, though the more erudite elements are strongly Arabic.

Their mode of life is very simple. They live upon rice, meat, bananas and milk. It seems worthy of mention that the Comoro people marry comparatively late, and that their simplicity and strictness of morals are in favourable contrast with those of many African tribes.

Their family life has something patriarchal about it. At weddings there is great profusion, and he who can manage it in any way will have 30 or 40 oxen slaughtered and distributed at the feast.

In trade the small island of Mayotta has most impor-

tance, yet the turnover has never exceeded a million pounds per annum; of late it has receded to £600,000.

Cocoa-nut palms form the chief wealth of the Colony, but cotton and vanilla are also planted. People from Bourbon and Mauritius carry on the cultivation of sugar and the manufacture of rum, which is exported to Madagascar.

On the eastern side there is a good roadstead. The islet of Zaudzi, where the European officials and soldiers live, also lies on that side.

Anjuan or Johanna is said to be a busy place and fairly prosperous; the inhabitants are fond of travelling, and go over to settle in Zanzibar or Nossi-Bé in considerable numbers. In consequence of the fertility of the soil, the cultivation of sugar has been tried and has yielded good return. Mutsamudu, the capital, is built of stone and has more than 4000 inhabitants. It is surrounded with irregular walls and angular towers.

Mohilla is reckoned unhealthy and is therefore avoided by Europeans. Its inhabitants are frequently employed on the plantations of Mayotta, and there are also sugarcane plantations on the island. Fumbuni, the capital, has pretty gardens in the environs.

Great Comoro has attained to no importance in trade worth speaking of. The want of good harbours and of a sufficiency of water for the soil prevent us from expecting any great increase in the future.

Cattle-raising is of some importance. The chief point of interest in the island is an active volcano, Cardalla or Jungu ja Dsaha, *i.e.* "Fiery Top", which rises to the height of 7500 ft. The circular crater, without a raised rim, lies in the middle of a plain of lava and has a depth of 450 ft. Eruptions of lava were observed in 1830, 1855 and 1858.

4. JUAN DE NOVA

In the middle of the Mozambique Channel, in latitude $17^{\circ} 3'$ S. and 75 miles west of the Sakalava coast, lies a small island which has been known since 1501, and which was named after the discoverer, the Portuguese Admiral Juan de Nova. A singular dread of this island used to prevail in seafaring circles. Even in quite recent times the most wonderful things have been related about it, and the cruelty of its inhabitants especially has been exaggerated in the most insane manner. In the year 1894 the German traveller Dr. A. Völtzkow visited the island, and has sketched a sober description of the place, which on account of its trustworthiness is reproduced here in its main features.

Juan de Nova, or Randanova, as the Malagasy of the west coast call it, is a flat island, $3\frac{1}{2}$ miles long and $1\frac{1}{4}$ miles broad. In one place the granite nucleus is visible, elsewhere we find well-preserved blocks of coral, inclosing *Tridacna*-shells. The coast-line is surrounded by an arid reef from half a mile to a mile in breadth. This has a steep descent to the sea on the north-west side, where it is inaccessible to ships on account of the heavy breakers. On the south-east the descent is less rapid, so that small vessels can be brought close to the shore at high water. Apparently the island is in its origin a core of granite, belonging to the region of West Madagascar, which has maintained its ground, this foundation having been subsequently covered by a layer of coral and subjected to some amount of upheaval above the water.

European ships have often been stranded on these island reefs, and their wreckage is yet to be seen there.

Juan de Nova is said to have been formerly covered with dense forest, but this has been in great part destroyed by the Sakalava. The most characteristic tree is the

oak-like Msahnini, with its great broad leaves. Cocoa-nut palms have been planted here and there; a great *Adansonia* is held sacred by the Sakalava. The doom palm (*Hyphæne*) only occurs in a few stunted specimens; on the other hand, euphorbias of tree-like dimensions are common. The sandy dunes are covered with a broom-like shrub (*Pemphis acidula*). The animal world is poor, and the numerous cats which have escaped from stranded ships and have run wild have apparently greatly thinned the ranks of the birds. Rats are obtrusive in their numbers. Besides crows (*Corvus scapulatus*) and kites (*Milvus parasiticus*), but few of the feathered tribe are seen. A small gecko (*Hemidactylus mabuia*) has apparently made its way into the island from Madagascar in the ships of the Sakalava.

The island is not continuously inhabited. Every year, at the commencement of the rainy season, there arrive Sakalava from Maintirano, a haven of the opposite west coast of Madagascar. These spend seven months in Juan de Nova, plant maize and melons in sheltered places for their subsistence, and employ themselves in catching the turtle (*Chelone imbricata*) whose horny scales furnish our tortoise-shell. The heads of the captured turtles are looked upon by the natives as "*fady*", they are stuck on poles or frames in the same manner as the heads of sacrificial animals. At the beginning of the dry season, when the turtles cease to lay eggs and return to the deep sea, the Sakalava leave the island and go back to their native coasts.

CHAPTER XIV

THE MASCARENES

FAR out in the Indian Ocean, to the east of Madagascar, lie three islands, which were discovered by the Portuguese in the year 1513, and called the Mascarene Isles in honour of the navigator Pedro de Mascarenhas. They are Réunion, Mauritius, and Rodriguez. Peculiar in their natural productions, they may be considered the veritable pearls of the East African island world. Tropical nature as here displayed well deserved to be taken as the subject of those classical and thrilling descriptions which Bernardin de St. Pierre has transmitted to us in *Paul and Virginia*.

All three islands are of volcanic nature and are therefore very fertile. Réunion is the most imposing and varied, on account of its mighty mountain masses. Mauritius is more level, and without mountains of any great size. Rodriguez, the smallest of the Mascarenes, holds a middle place in the character of its landscapes.

The climatic conditions, the plants and the animals present so many features in common that a separate description in these respects becomes superfluous; the ethnical character is also the same in all.

The climate of the Mascarenes is a pleasant one, owing to the prevalence of the Trade Winds. The mean annual temperature at Port Louis, the capital of Mauritius, is 77·2° F.; on the plateau it is only 74·5° F. The average of 19 years' observations, placed the extreme temperatures as 88·9° and 53·4° F. Thunderstorms were noted on 34 days in the months from January to April



Vegetation in Réunion.

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inclusive. The driest months are September and October.

The Island of Réunion has a hot and wet season (*hivernage*) from November to May, and a cool dry period from May to October, but the distribution of rain differs in different places on account of the different elevations of the ground.

St. Denis, the capital, in the north of the island, with 130 rainy days has a rainfall of 67 inches, Ste. Marie has 78 inches, while St. Benoit, with 244 rainy days, has 156 inches. The conditions of temperature vary with the height above the sea. From the coast, where the temperature is tropical, we have the whole thermometric scale down to that of the temperate zone, for in August the Piton des Neiges, the highest elevation, is not uncommonly covered with snow. The reception of strangers has consequently developed into a regular industry on the island, as the dwellers on the coast of the Mascarenes frequently seek out the cool mountain air of Salazie, where medicinal springs are also to be found.

The conditions of health are favourable, though the islands are not entirely free from fevers. The climate, otherwise so pleasant, has one drawback in the frequency of whirlwinds or cyclones. The hurricanes of Mauritius are notorious, and the region of the Mascarenes is a veritable centre of mighty atmospheric disturbances, which are especially frequent in the months of February and March. In accordance with observations extending over 25 years, the 53 cyclones were distributed as follows: February and March together had 30 hurricanes, January 9, April 8, and December 6. The area of formation extends from 8° to 12° S. lat. The wind, raising the sea into fearful commotion, proceeds first in a west-south-west direction till it reaches Mauritius and Réunion, and then it takes a more southerly course.

The approach of a cyclone is announced by a heavy

fall of the barometer; the Meteorological Station signals the threatening phenomenon; warning signals call upon the inhabitants of the coasts to take the necessary precautions; ships seek out a safe place or retire to the open sea, as even good-sized vessels are sometimes cast ashore by the violence of the sea. The force of the waves is so great that heavy blocks of coral are torn from the reefs and thrown far inland. The storms uproot trees, and houses are blown down or carried away. In the year 1868 one of the most violent whirlwinds destroyed some 50,000 houses. Gardens and plantations in the neighbourhood of the coast were devastated and denuded of their loose soil. The duration of these atmospheric disturbances varies; the whirlwinds are often over in a few hours, sometimes they last for days, or the hurricane, after apparently ceasing, is immediately followed by a second.

The flora and fauna of the Mascarenes are quite different from those of the neighbouring Madagascar, and have a peculiar stamp of their own. Their earlier singularity has of course lost much since the appearance of man and the extension of cultivation, but on the other hand new elements have been introduced from Madagascar, Africa, Asia, and even America.

The plant world attains an astonishing development, in consequence of the abundant supply of water, and where the vertical elevations are considerable, there exist different zones of vegetation.

The lower-lying localities which predominate in Mauritius, but in Réunion only occupy the belt of coast, form the zone of cultivation. Here sugar-cane, maize, manioc, vanilla, and other plants of cultivation are grown abundantly. Cocoa-nut palms flourish in rich luxuriance side by side with the fan palms (*Latania borbonica*), agaves and opuntias are conspicuous. By the wayside, mangoes and benzo trees bestow beneficent shade in the gardens.

Still more massively shaped are the dark crowns of the Jack tree or Jacquier (*Artocarpus integrifolia*) whose light yellow wood is made into splendid furniture. The closely related bread-fruit tree (*Artocarpus incisa*), with its deeply cut leaves, possesses a far more penetrable foliage, as does the melon tree, whose delicious fruit is made into preserve.

The forests on the coast consist partly of casuarinas and partly of fig-trees, which are twined round with stout lianas. Among them are scattered screw-palms, of which several species occur. Mauritius possesses 9, Réunion 4 and Rodriguez 2 peculiar species of pandanus.

Mallows, borage (*Borago africana*) and thorn-apples (*Datura Tatel* and *D. Metel*) grow in the rubble. On the heights, raspberries climb on the rugged precipices, and yellow-green aloes, with their gigantic flower-stalks, are found on the gentler declivities.

Coffee is planted in the mountain region. The dwellings are enclosed by gardens of chou-chou (*Scchium edule*). Begonias bloom in rare luxuriance on the banks of the streams. At 3000 ft. begin the picturesque groups of the mountain-bamboo (*Nastus borbonicus*), which Bory de St. Vincent discovered on the island of Réunion. The appearance of the numerous ferns and club-mosses is an additional characteristic of this region. In Réunion, with its 240 species, we find extensive tracts of fern. among which the Plaine des Fougères above St. Denis has become quite celebrated. The Alpine region of the Piton des Neiges produces only a miserable vegetation.

The animal world of the Mascarenes has greatly altered in character since the arrival of man, and it is just the typical species which have to a great extent disappeared. As we have already seen, in this respect the oldest accounts of travel of the 17th century give us noteworthy information on the subject—namely, those of Bontekoe, Dubois, Duquesne, and especially those of François Leguat.

At no time, indeed, were there any of the larger land mammals, but the dugongs (*Halicore cetacea*) frequently sought the shore region. They were so tame that they could be killed on the beach without difficulty.

The land birds, too, which occurred in great numbers, showed so little fear that they could be caught with the hand. There were gigantic flightless ground-pigeons on all three islands, one species peculiar to each; they were called *dodo* or *dronte*. The dronte of Mauritius (*Didus ineptus*) attained the size of a goose. It was first mentioned in 1598, but by 1693 it was already completely exterminated, for the mariners and the Dutch settlers killed the birds wholesale. Réunion had a species of a different colour, almost white (*Didus borbonicus*), which still occurred frequently in the last century. The solitaire (*Pezophaps solitarius*) inhabited the island of Rodriguez and has left a large quantity of bones there. A gigantic waterhen of the height of a man, the Géant (*Callinula gigantea*), once lived in Réunion and Mauritius, and was observed still in great numbers by Leguat in 1693. A blue sultana of considerable size, called by the inhabitants *l'oiseau bleu de Bourbon* and designated by Schlegel *Porphyrio caerulescens*, was peculiar to Réunion. The *Fregilupus capensis*, which approached our hoopoe, has recently become extinct, and a shrike (*Oxynotus Newtoni*), formerly widely distributed, has become rare. Large land-tortoises seem to have been present in all three islands in abundance, for when Leguat arrived at Rodriguez in 1691, he saw bands of 2000 to 3000 together. The ground was so paved, as it were, with them, that it was possible to take a hundred steps at a time, striding from one back to another. A similar account was given about Mauritius and Réunion so late as the middle of the last century, but since then the extinction has become complete. Other animals, on the other hand, have been introduced, intentionally or not, as the squirrels from

India, and hares (*Lepus nigricollis*) from the Malabar coast. A stag of Asiatic descent is also found in Mauritius. (*Cervus Aristotelis*?)

In order to diminish the number of locusts, the Philippine starling or mynah (*Acridotheres tristis*) was introduced into the Mascarenes in 1755. They multiplied very rapidly, and are still held in such high esteem by the inhabitants that people are not allowed to shoot them, and they seldom even catch them. Our sparrow has become naturalized since 1848. Of lower animals American cockroaches and sand-fleas have gained an entrance; the colonists have introduced the vineyard snail of South Europe (*Helix aspersa*), which has become a common creature in all gardens, but on account of the poor supply of lime makes itself a strikingly small shell. The European bed-bug flourishes so abundantly on this tropical soil as often to become a torment.

The invertebrate kingdom makes itself conspicuous in the appearance of great spiders, whose yellow webs are woven of very strong threads. *Epeira opuntia* is common on all prickly pear and agave hedges, where it is skilful in catching the blue carrion-flies.

The domestic animals have been introduced since the arrival of man. Pigs and domestic poultry are largely represented; on the other hand, cattle are few in number; horses, which had formerly to be bought in Abyssinia and Somaliland, are more common.

The population exhibits a very mixed ethnical stamp which is of a similar character in all three islands, as also in the Seychelles further north. Formerly entirely without inhabitants, the Mascarenes were first colonized towards the middle of the 17th century. The Dutch, who had taken possession of Mauritius as early as 1598, established a small settlement in Grand Port in 1642. Almost at the same time the first French colonists reached Réunion. These were 12 Frenchmen who had taken part

in a mutiny at Fort Dauphin and were banished to this island. The oldest settlement is St. Paul, on the west coast. The Dutch gave up their colony in Mauritius in 1712, and a few years later, in 1715, the French took over their legacy, so that the nucleus of European settlers in the Mascarenes is of French origin. In order not to lose their national characteristics by the admixture of foreign blood the first colonists applied to the mother country with the request to send young women from France to the Mascarenes. A number of Parisian orphan girls had the courage to go out; their names were discovered not long ago in the Archives of the French Ministry. They laid the foundations of many vigorous families, and from them comes the touch of aristocracy which distinguishes the French Creole women, and also the harshness of the social ban with which they visit intermarriages with people of colour. Individuals among the Creoles of these East African islands have distinguished themselves by their business activity and even by their achievements in science and art.

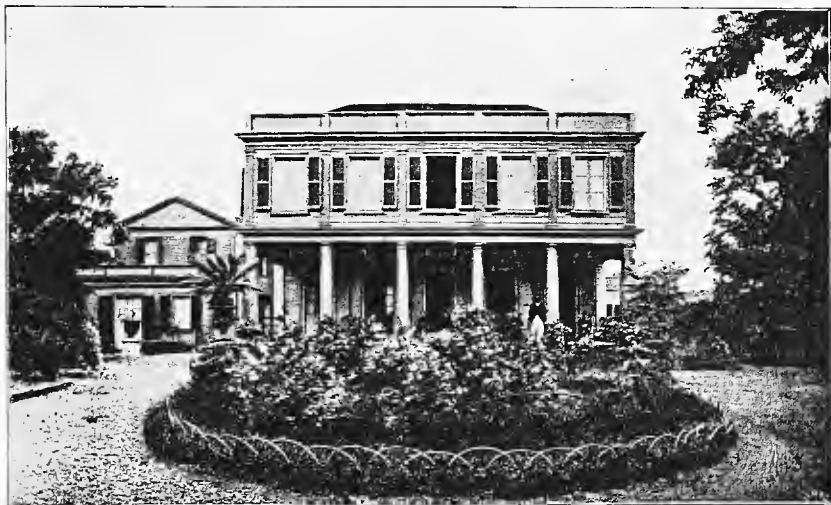
It is in the highest degree noteworthy that the fecundity of the race has suffered no diminution in this climate, but on the contrary that it has increased, being greater by a third than in the mother country.

The insular position they have so long occupied has not been without its influence upon their intellectual character, and there is therefore a certain interest in comparing the French Creole with the type of Frenchman of the present day. In one direction he has gained, but in another various singularities and weaknesses have come into prominence.

The Creole lives under favourable climatic conditions. The struggle for existence has not been severe, so that neither selfishness nor reserve are displayed in their character; on the contrary, the Creole is hospitable and sociable, being often of attractive *naïveté*. The attach-

ment to the mother country is great and well founded, for France has always bestowed remarkable attention on this colony, and in times of need has lent it powerful support. Though the people of Mauritius have been under English rule since 1810, the fidelity to their sometime mother country has remained unchanged, and they are in general very exclusive towards the English officials.

In good-nature the Creole is more highly endowed



Creole Country-house in Réunion.

than the average Frenchman of the present day, and he seeks the centre of gravity of his existence in the family circle. Externally this makes itself felt through the pleasing arrangement of his house. The dwelling of a well-to-do Creole is surrounded by charming gardens, a broad roadway shut in by cocoa-nut palms leads to the tasteful house, whose roomy veranda serves the inmates as a sitting-room in the mild tropical evenings.

The Creole women are with justice looked upon as

beauties; their external appearance has received something of the distinguished grace of the women of Paris. They are said to be peaceable wives and careful mothers, but as the intellectual stir in the colony is small, they fall back to a great extent on external trifles, so that to many husbands luxury becomes burdensome. In domestic service there is no stint; an Indian cook, a lady's-maid for the lady of the house, and a valet for the master, a black for running errands, a Hindoo to look after the washing, nursemaids for the children, gardeners etc.—all these are necessary to the household of an ordinary citizen.

The daily table is nevertheless very simple, and consists for the most part of curry and rice, followed by fruit, of which there is no scarcity, as mangoes, bananas, oranges and guavas are superabundant.

The standard of education among the Creoles was formerly not very high, they even looked down with a sort of contempt upon higher intellectual culture, as in their opinion people were only spoiled by it. Recently it has become much better, as the activity of the half-castes was becoming dangerous, and there is no want of educational institutions.

One weak side of the Creoles is their thriftlessness, which is sometimes extreme. It originated in the time when money flowed plentifully towards the Mascarenes and the sugar plantations especially brought in large profits. Many families at that time obtained money with ease. When a planter came to France he had many friends, for he was open-handed, and if he brought a young "sucrière" with him she became the ideal of the marriageable young men, and was not in want of adorers.

Not all families were at that time given to saving. There came bad times, as the German beet-sugar offered a ruinous competition. Many Creoles grew poor, so that the trade with them was no longer so safe as

before. If a Mauritius or Bourbon man came to grief in business he used generally to retire from society, and would emigrate to Madagascar, where he would frequently find a well-to-do Malagasy woman who would become his wife and find him at least in curry and rice. I have often met unsuccessful men of this class on the east coast of Madagascar.

The Creole has obviously deteriorated in energy by his residence in the tropics. When during the last war the inhabitants of Réunion supplied a volunteer battalion for the subjugation of the Hova, it showed itself useless from the very first. In language, too, this characteristic comes to light. A tolerably pure French is spoken everywhere, even when the schools are under English management. The pronunciation, however, is something like that of a child. The *r* is regularly omitted, *ch* and *j* are replaced by *s*. The Creole does not say "*c'est joli*," or "*je jure*" but "*c'est soli*," "*se sue*." They have no scruple in conjugating an irregular verb regularly, and many verbs are used in a wrong sense: *espérer* is constantly used instead of *attendre*. Expressions such as *Ça même* or *Comme ça même*, which serve as affirmations every minute, but which are also used in every possible meaning as well, are quite inadmissible in France. Malagasy, Hindoo, and Arab elements are also often introduced into the language, thus the mode of salutation is always *Salam!*

The coloured population is far in excess of the Europeans in number.

When slavery, which still existed in Réunion after having been done away with in Mauritius ten years earlier, was abolished in 1848, the immigration of Hindoos assumed great dimensions, and at present their influence is very important. The Hindoo comes for the most part from the Malabar Coast, and he engages himself on the plantations for a term of years. After the expiration

of his contract he becomes cook, errand-boy, shop-keeper, or takes a holding and turns farmer. The Malabar native is industrious and accustomed to save. The women, often of remarkably fine stature and picturesque bearing, assist busily in the shops; the provision market is almost entirely in their hands.

The Malagasy element has played a great part in the Mascarenes from the first. Formerly the Malagasy worked as a slave on the plantations. His desire for freedom was, often enough, too powerful to allow him to endure the fetters, he would run away and roam about the mountains, living by robbery, as a "*nègre marron*." Their skill in wickerwork made the Malagasy always very useful; they worked up the aloe fibres into cords, and from the leaves of the screw-palm they plaited durable bags in which sugar and coffee were packed for exportation.

Negroes from the East Coast of Africa have immigrated into the country at different times; their ugliness is often quite repulsive. They are called Kaffirs in current speech, without regard to their original home.

The Arab settlers are few in number; but, on the other hand, the Chinese immigration has made itself very perceptible of late, although it is not looked upon with favour. The Chinaman generally settles down as a suburban publican.

The numerous half-castes of all shades who are lumped together under the name Mulatto, require a separate discussion. As being the result of crossing two different races among whom the moral qualities do not always stand high, the Mulatto is nowhere looked upon by the Creoles as an equal, and the European holds himself as distant from him as possible. A French Creole who marries a Mulatto woman from pecuniary considerations is excluded from good European Creole society.

The Mulatto is darker or fairer according to the

amount of Negro blood. There are Mulatto girls of startling fairness and great beauty, who are, however, easily recognized as half-castes by the crinkled hair and the shape of the head.

The Mulatto is gifted, and takes revenge for his slights by putting himself forward on all occasions, by manifesting praiseworthy zeal for learning when at school, and by striving to attain wealth. Having succeeded in this, he displays an obtrusive luxury; Mulatto women strut proudly about in the finest Parisian toilettes, and frequent the streets of the cities in the most costly gold ornaments in order to vex the poorer Creole women.

Boundless vanity, boasting and ambition form the leading traits of these half-castes, though there are not wanting individuals of good and really cultured character.

Like all immature minds they are inclined to extremes, and in their view the mother country would long ago have been ruined if it had not been kept up by the Mulattoes. Laxity of morals is strongly stamped upon them, but, in spite of this, their physical appearance is strikingly vigorous.

CHAPTER XV

RÉUNION

RÉUNION surpasses its sister island in size and in its varied formation. Seen from the sea under a cloudless sky, it presents an imposing aspect. Beginning at Cape Bernard in the north it rises quickly from the coast and mounts in bold lines to the Piton des Neiges, 10,000 ft. high, and then slopes gently off to the south. Generally this picture is only to be enjoyed in clear outlines during the early morning hours of the dry summer months, for during the day the mountains are for the most part veiled in mist.

The shape of the island is an ellipse, with a major axis of 44 miles, while its minor axis is only $31\frac{1}{2}$ miles. It lies to the south of the 20th parallel and embraces an area of 750 square miles. The coast-line is comparatively small, as the circumference only reaches 129 miles. There are no bays cutting deep into the land, so that there is not a single harbour; the ships are obliged to anchor in an open roadstead, and the landing is rendered more difficult by the prevailing high winds. An attempt has been made very recently to remedy this evil by constructing an artificial harbour at the Pointe des Galets. The roadstead most frequented is that at St. Denis in the north, but formerly, when the sea was very rough, the steamers would anchor at St. Paul. The beach is almost everywhere covered with shingle or boulders; coral formations are only found locally.

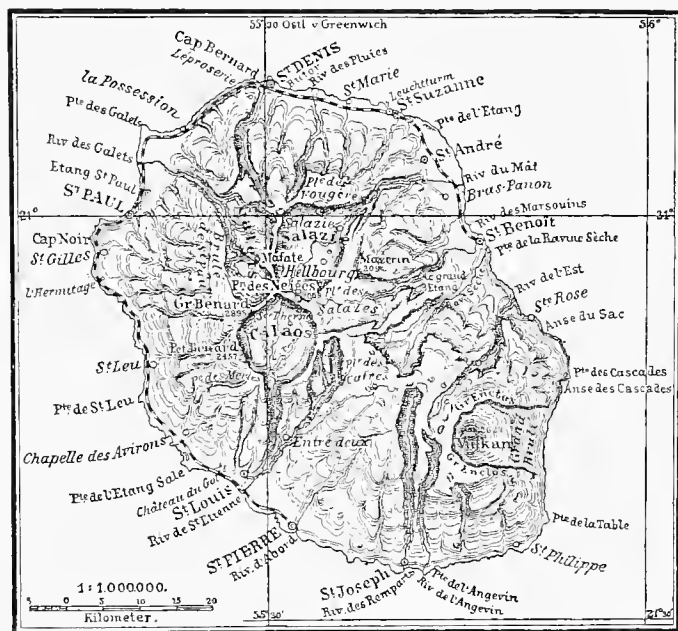
The coast plains are only of small extent, the steep slopes of the volcanic mountain land seem scored with



Ravine near St. Paul on the Western Side of the Island of Réunion.

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deep furrows, especially on the western side; sometimes there are narrow gorges which render the interior of the island accessible. The most important elevations lie pretty accurately at the foci of the ellipse; in the northern part the Piton des Neiges rises to the height of 10,230 ft.; on the south, on the other hand, the Piton de Fournaise is only 8612 ft. The latter is an active



Map of Réunion.

volcano which from time to time ejects great masses of lava (*coulées*). Violent eruptions took place in 1775, 1800, 1812, 1824, and 1858. This last covered the railway with a layer of lava 10 to 12 ft. thick, for an extent of 1300 ft. The eruptions in the years 1860 and 1864 were still more copious, masses of lava flowing down in a broad channel as far as the sea. Smaller eruptions

occur almost every year. Three enormous craters or cauldrons are grouped round the Piton des Neiges. Their activity has long ceased and they are now covered with luxuriant vegetation. These cauldrons are Salazie, Mafate and Cilaos, names taken from three Malagasy: these were outlawed negroes who had broken the chains of



Cilaos and Piton des Neiges (Réunion).

slavery and had found a secure place of concealment here, living on roots and resorting indeed to robbery as well. The crater of Salazie, surpassingly rich in natural beauties, is the best known. It has an area of 25,000 acres and in parts is well cultivated. At a place called Hellbourg there are hot springs, which, being strongly medicinal, are much visited. They were dis-

covered by a sportsman in 1831. They yield from 50 to 75 gallons of water an hour, at a temperature of 80° F., and contain 12% of carbonates. The walls of the crater rise almost perpendicularly to the height of 6000 ft. and then pass into extensive plains (*Plaine des Salazes, Plaine des Chicots, Plaine des Fougères*). The crater of Cilaos is also renowned for its beauty; it possesses medicinal springs, as does also the crater of Mafate.

The rainfall is abundant, waterfalls and brooks occur plentifully in the interior, and in the vicinity of Hellbourg there is a crater lake. Of larger rivers there are in the north the Butor and the *Rivière de St. Denis*, the *Rivière du Mât* drains the crater of Salazie, the *Rivière St. Etienne* issues from of the crater of Cilaos, the *Rivière des Galets* from the crater of Mafate.

The population of the island has settled principally in the neighbourhood of the coast. The houses of the villages and towns are of one storey and are half concealed in a sea of verdure. A railway along the coast, 79 miles in length, facilitates trade and affords opportunity for travelling round the island. The numerous towns and villages are generally named after some saint. Thus in the north there is *St. Denis*; in the east, *Ste. Marie, Ste. Suzanne, St. André, St. Benoit, Ste. Rose*; in the south, *St. Philippe, St. Joseph, St. Pierre*; lastly, in the west, *St. Louis, St. Leu, St. Gilles, and St. Paul*; the only exception is *La Possession*, which was erected at the spot where possession was first taken of the island.

St. Denis is the capital and the centre of Creole life. It has nearly 40,000 inhabitants; the whole district contains a population of 50,000 souls, a mixture of Malabar people, Mulattoes, Malagasy, and Chinese, side by side with the French Creoles.

The town rises from a gently ascending plain; it is

completely shut in on the west by Cape St. Bernard with its masses of basalt sloping steeply towards the sea, so that the railway from St. Paul has to pass through a long tunnel. The houses are generally of one storey and are built of wood. The public buildings as well as the villas lying outside the town are of solid masonry. The streets are straight and intersect at right angles. The main artery for trade is the broad Rue de Paris with the Townhall, the Governor's palace, and a monument to Mahé de Labourdonnais, who did so much for the prosperity of the colony. At the end of the Rue de Paris we reach the Museum of Natural History, which is very well organized considering the moderate resources at command. It displays the fauna of the Mascarene islands and Madagascar in delightful completeness.

Adjoining this is a Botanical garden with splendid groups of palms, bamboos and fig-trees, in whose shade the Creole population is wont to seek recreation. In the east of the city lies the Military Hospital as well as the spacious barracks. Outside the town is a lazaret house for lepers, where the patients, some 50 in number, are tended by nuns; a few convicts from the galleys are entrusted with the duty of keeping watch over the sick.

Among noteworthy public works in the remaining part of the island, besides the circular railway already mentioned, the new harbour at the Pointe des Galets must be particularized. This artificial harbour was constructed at a cost of £2,280,000. It covers an extent of 40 acres. As it has a depth of 26 feet, even large steamers can take shelter in it. The harbour is but little exposed to the cyclones, as these are pretty well spent and have lost their violence by the time they reach the prominent Pointe des Galets. The whole population of the island was put down at 167,847 souls in 1896, so

that the density of the population is 217 to the square mile; some 65,000 of these are immigrant labourers.

Let us pick out the most important products of the island, those which serve, so far as the remarkable elevations of the ground permit, for the maintenance of this population, whether plants of specially tropical culture or cultivated plants of European origin.

The most important plant of cultivation is the sugarcane, which continually gained in extent after 1815, reaching its culminating point in the beginning of the sixties. Then (1862) there were 116 sugar refineries at work; their number has now diminished by one half. The export of sugar, which was not less than 68,000 tons in 1860, has diminished in a corresponding manner.

Of cereals the cultivation of maize and of rice is to be mentioned; coffee culture is extensive, having as early as 1861 produced 412 tons. The culture of vanilla enjoys a great reputation; the export of vanilla pods has risen to more than 30 tons in the year. Of palatable fruits quite a superfluity prevails; the island produces pine-apples, bananas, grapes, oranges, melons, as well as bread-fruit for the Mulatto population. In the higher parts of the island the cultivation of vegetables is briskly carried on, to supply the markets in the towns.

The coffee fungus has established itself among the natural enemies of cultivation, so that now the Liberia coffee, which withstands it better, is being introduced. The "*Larve géographique*" very frequently gnaws to pieces the mesophyll of the coffee leaves. The caterpillar of *Papilio demoleus* does great harm to the orange culture. The caterpillar of the "Borer" has installed itself in the sugar plantations; this gnaws the pith and so diminishes the produce. Cattle-raising is of little importance, and the rearing of pigs is only extensively carried on in the mountains of Salazie.

Local industry seeks to satisfy the chief wants of the island (baking, tanning, manufacture of clothes). Cabinet-making forms an object of industry worth mentioning, very beautiful articles being made from the wood of the jack tree. The manufacture of rum has become of great importance, some 40 distilleries turning out 22,000 gallons of rum, chiefly for exportation to Madagascar, where unfortunately it has already wrought great harm. The chief imports are wine, oil, soap, live stock, rice, tools, woven goods and *articles de luxe*.

From 240 to 250 vessels, French and foreign, annually visit the roadsteads of Réunion. A line of steamers belonging to the *Messageries maritimes* keep up a regular intercourse with Mauritius, the coasts of Madagascar and Zanzibar.

The total amount of trade was put down as something over £1,640,000 in 1886; an import of £1,125,000 standing against an export of £540,760; the position of the colony was then far from favourable and the colonists had become poor. Since then the position has somewhat improved, for in 1895 less must have been imported—viz., only £871,040; while the exports had a marked increase—viz., to £628,760. French trade is credited with £360,000 of the imports, while nearly the whole of the exports (£592,000) go to France.

Intellectual culture, which was formerly somewhat neglected, has recently made progress. £40,000 is allotted annually for purposes of education. 12,000 children of both sexes are taught in 157 primary schools. The capital, St. Denis, possesses a Lyceum attended by 400 pupils, the professors of which have to obtain in France their proofs of efficiency as teachers.

The press is represented by various journals besides the *Journal officiel*. The *Album de l'Isle de la Réunion*, published by Roussin, is an excellent product of Creole literature. Science is fostered by a special

society of savants, among whom we may emphasize such well-known names as Coquérel and Vinson.

The religious life is regulated by the higher and lower orders of Catholic clergy. There was formerly an Apostolic Prefect at the head of the Catholics, who number over 100,000; since 1850 the colony has been raised to a bishopric and embraces 51 parishes with 72 priests. Besides these there are several religious organizations engaged in education or works of benevolence.

The political institutions permit to the colony a certain freedom of action which stands in advantageous contrast with the centralisation of the mother country.

At the head there is a governor who is subordinate to the French Ministry of Marine. At his side is a Council, which on special questions admits the Bishop, the Rector of the schools and the head of the Immigration Office to its deliberations. The Director of the Interior looks after administrative matters. His position corresponds somewhat to that of a prefect. The administration of the interior is divided into two wards (*Arrondissement du Vent* and *Sous le Vent*), each of which has several parishes. These last are governed by parish councils nominated by the electors. The administration of justice is placed under a special Procurator-General.

The military establishment is limited to some 500 marines and one battery of artillery, to which may be added the police, 170 in number, as well as the militia. Among foreign States America, England, Italy, Portugal and Belgium maintain consulates at Réunion.

The history of the island is rich in noteworthy details and vicissitudes. Many doughty forces have co-operated in the development of the colony, which reached its highest point at the middle of this century.

The island was originally called *Santa Apollonia*; this was the name by which the Portuguese had christened it on its discovery. In 1545 it received the name

of Mascarene Island; this appellation was afterwards extended to all three islands; after 1649 it was called Bourbon; in 1734 its official designation became Ile de la Réunion, and in 1805 Ile Bonaparte. In 1815 the earlier name, Bourbon, was restored, but was changed again later into Réunion.

The first immigrants arrived in 1646. These, as has been mentioned, were 12 banished Frenchmen who had taken part in the rising at Fort Dauphin. They found the land wooded down to the sea coast, but so healthy and fertile that Flacourt, in his capacity of ruler of the young colony of Madagascar, took formal possession of the island in 1645. New comers founded the earliest town, St. Paul, in the west; gradually new settlements arose in the north on the arrival of further colonist families, as Ste. Suzanne in 1667 and St. Denis in 1669. At the end of the 17th century the colony was still in its infancy, and its population numbered only 500 souls. In order to assist them the government sought to introduce profitable objects of culture. They made an order in 1717 that all inhabitants between the ages of 15 and 60 should be obliged to plant and tend a hundred coffee bushes per head. Instead of the bad wild coffee they introduced an excellent sort from Mocha in Arabia, which flourished so well in the island that the export of coffee quickly increased. During 1734 as much as 9 tons were exported, and by 1789 the export of coffee amounted to 2000, and in 1801 even to 3500, tons. Among the governors who in the last century developed great organizing ability and brought about a well-ordered condition of things, Mahé de Labourdonnais deserves to be distinguished as the greatest.

Troublous times set in with the present century, when there were complications with England. As early as 1806 the English captured a French ship with its cargo in the roadstead of St. Denis, without anyone's having



St Paul—the Oldest Settlement in Réunion.

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a presentiment of what was coming. England, who needed a point of vantage on the way to India, renewed her hostile attitude. Natural occurrences came to her help. In 1807 there fell such a violent storm of rain that almost all the plantations were destroyed and the fertile earth was washed away; a hurricane lasting four days completed the picture of destruction. The famine that followed swept away a great number of the inhabitants; for three months the police had nothing to do but to draw up lists of the dead. The colony, thus weakened, had ultimately to surrender to the repeated attacks of the English, who had been at first beaten off, as the means of further resistance were insufficient.

On the 6th July, 1810, 20 English ships with 5000 men made their appearance. The troops, under the command of Col. Keating, landed at several points. There was a bloody contest at the Butor river, in which the Bourbon Creoles were defeated. The capital, St. Denis, was occupied by English troops, and an honourable capitulation was signed on the 10th of July. England only held the island of Réunion for a few years. On the 6th April, 1815, it was restored to France by treaty. Very soon, the introduction of new objects of cultivation as well as the improvement in the education of the people, laid the foundation of renewed prosperity. The new sugar industry and the cultivation of vanilla turned out profitable; in 1819 St. Denis acquired a well-managed *Lycée*. Since that time the colony has developed itself without any great vicissitudes. The year 1848 brought the emancipation of 60,000 slaves. This measure, prepared for years beforehand, produced great excitement, and risings of a serious kind were anticipated. When, on the 20th December, the emancipation was officially explained to the blacks, they expressed their gratitude, after which they made merry with dancing, returned to their homes at sunset, and next day worked as usual on the plantations.

A serious revolt in the year 1868 has to be recorded. An enraged mob beset the open place before the Townhall and demanded the expulsion of the Jesuits, who had become unpopular. The bloody contests that then took place led to a regular rising, which lasted for months; finally, some of the demands of the people were complied with.

CHAPTER XVI

MAURITIUS

At a distance of 120 nautical miles to the north-east of Réunion lies the sister island of Mauritius, which since the beginning of this century has been an English colony. Less grand, but with a loveliness of landscape which vies with that of the sister isle just described, Mauritius is likewise of volcanic origin; its geologic age indeed is distinctly greater, for the coast is in many places strongly indented, and the interior is a mountain land of no great height, the elevation of its plateau scarcely exceeding 1600 feet.

The surface of the whole island embraces an area of 74,789 miles, and it thus takes the second place in this respect among the Mascarenes.

The northern extremity lies almost exactly on the 20th parallel of latitude, the southern is in $20^{\circ} 50'$ S. lat. and $57^{\circ} 20'$ E. long.

The mountains rise somewhat precipitously from the coast and pass into a central plateau, which is dominated by the Piton du Milieu, 1945 ft. Its summit is formed by basaltic masses of horizontal structure. The highest elevation is in the south-west, where the mountains of Rivière Noire rise to 2710 ft. Pinnacles of unusual shapes rise on the west side, where there are the Pouce (2480 ft.) near the capital, Port St. Louis, and Pieter Both (2674 ft.) which has the form of an obelisk. This latter is well-known to sailors, as it serves as a landmark for ships; it bears on its summit a spherical rounded block 100 ft. high.

Besides the basaltic masses we must mention the recent

the water in the neighbourhood of Mauritius, as La Ronde, La Plate, Coin de Mire, Ile aux Cerfs, etc. This proves that the area in which Mauritius is situated is at the present time one of upheaval, like that of the East African coast.

The slight elevation of the ground does not permit of such a cooling of the moist trade wind as takes place in the island of Réunion, and thus the amount of rain allotted to it is less uniform. At the time of the tropical winter rains the brooks are quickly flooded, while in the dry season they are short of water. Of course the increasing destruction of the forests bears its part in this. As cultivated land was gained for the sugar plantations the space occupied by the forests, which was of great extent in the last century, has been gradually reduced to a few estates of no great size in the interior; this has lessened the fertility of the country. The climate is in consequence comparatively hot, and the island is not free from fever.

The principal streams are the rivers des Lataniers, de la Terre Rouge, du Tombeaux, des Pamplemousses, du Rempart, Noire, and du Tamarin. In the south there are crater lakes of small extent.

The settlement of the island has not remained confined to the coast, as was necessarily the case in the mountainous sister isle, the interior being also fitted for cultivation, and consequently the population here is much denser. According to the statistical returns of the year 1894, Mauritius numbers 376,200 inhabitants, and thus has a population of 504 to the square mile.

The single large town is Port Louis. It has 70,000 inhabitants and owes its rise to its excellent harbour, which is well protected by coral reefs. As the Creole element, despite the English Government, clings tenaciously to its original French character, the life of the people is in full accordance with that of the sister isle.

The impression made by the capital, which lies in the north-west of the island, is thus described by Baron Claus von der Decken:—"At last the City of Port Louis emerged from the woods which had hitherto concealed it—a smiling prospect, with the pleasant white-washed houses on the shore in the European quarter, the huts of the Malagasy and the negroes further up, the groves of Casuarina and other trees of unwonted appearance, and the luxuriant landscape with its misty heights in the background. The figures which we met here were most striking. There were Malagasy, tall robust forms of chocolate colour, with their well-greased hair twisted into elegant plaits; Hindoo coolies or load-bearers, who in Mauritius take the place of the Arab labourers in Zanzibar; lastly, Chinese with their long pigtales. Then the English soldiers attracted our attention by their free and easy bearing. We wandered through the broad macadamised streets bordered by low houses, till the darkness came on and the rain drove everyone indoors."

Near to the quay, among beautiful buildings, we find the statue of Mahé de Labourdonnais, who founded the city in 1735. In the interior the city has a poverty-stricken appearance, as the well-to-do population live in the suburban country houses.

The city is commanded by a battery above, and there are two forts on the two sides of the entrance to the harbour.

Crossing the river in the north, we reach, at a small distance, the classical spot Pamplémousse. Here it was that Poivre, in the year 1768, laid the foundation of the splendid Botanical Garden, which is still much visited. At this place was enacted the last sad scene of "Paul et Virginie". The Creoles shew to strangers what purports to be the grave of the Creole children, so poetically described by Bernardin de St. Pierre, united in a common place of rest after their tragic death. A memorial, the

creation of a Creole artist, has recently been erected there in honour of these beings, who are held sacred by all inhabitants of Mauritius.

The remaining towns of the island are not of importance.

Curepipe, which lies high up, has made progress, being used as a place of recreation during the hot season by the planters, on account of its fine air; but the well-to-do people more frequently go to Réunion, to spend the hot winter months in the mountains of Salazie, where the reception of visitors has become a regular industry, or to make use of the curative hot springs of the island. On the east coast, near a well-sheltered harbour, lies the village of Mahébourg, which possesses a certain historical interest, as it was here that the Dutch founded their first settlement. South of this village the "Souffleur" or spouting-rock is pointed out as a curiosity. This is a basaltic rock hollowed out by water in such a manner as to throw up a jet of water 50 ft. high when struck by the waves of the sea.

Extensive lines of rail lead inland to the several plantations, and a diagonal railroad connects Port Louis with Mahébourg.

The country is little suited for breeding cattle, and most of the meat is brought from Madagascar, where cattle are to be had in abundance.

Industry is almost limited to planting, and the pre-dominant object of culture is the sugar-cane. In the sixties the sugar industry sent out as much as 120,000 tons of sugar, and the 40 distilleries produced 450,000 gallons of rum besides. The whole of this branch of industry has seriously retrograded, owing to keen competition, to exhaustion and deterioration of the soil, and also to destructive parasites, among which the borer has proved especially injurious.

Trade, which is carried on almost exclusively at Port Louis, has diminished in a corresponding manner, the

diminution being further substantially increased by the opening of the Suez Canal. The harbour of Port Louis is, notwithstanding, visited at present by over 500 ships a year, whose burden for 1896 was put down at 641,000 tons. In the same year the whole amount of trade in Mauritius was 520 lacs (52,000,000) of Indian rupees, of which 210 lacs were for imports, 310 lacs for exports; these numbers prove that the trade has diminished by about a third in the last twelve years.

The intellectual life of the island has preserved its French character. Not only the language of intercourse, but also that of the periodical press is pre-eminently French. About 16,000 pupils, white and coloured, receive instruction in the 114 existing schools. Among scientific institutions we must give prominence to the Natural History Museum as well as to the admirably conducted station for meteorological observations.

The people of Mauritius are almost exclusively Catholics; they are distributed among thirteen parishes.

The system of laws is a mixture of French and English jurisprudence, a circumstance which has given rise to many complications.

At the head of the colony is a Governor, named by the Crown, with whom there is a Governing Council of 5 members, also named by the Queen. There is, besides, a Legislative Council of 27 members, partly named by the Governor, to which one member is chosen by each of the nine electoral districts, except Port Louis, which has the right to choose two representatives. The colonial budget of 1886 showed an expenditure of £840,000 against a revenue of £750,000. The military establishment numbers 450 soldiers.

Let us, in conclusion, throw a glance on the earliest settlement and the gradual development of the colony of Mauritius.

After the discovery Portuguese navigators came occasion-

ally to the island, which sometimes bears the name of Cirne in the earliest maps, but was sometimes called Caïnas ; apparently Ciénos was the proper designation, meaning something like Swan-island. This name may have been derived from the ground-pigeons or dodos, as large as swans, which were then numerous on the island. As the Portuguese put forward no claims to possession, the Dutch next planted themselves there and gave the land the name of Mauritius, in honour of one of the Dutch stadtholders. No real settlement took place till 1642, when several Dutch families, with a military post and some slaves, took up a permanent abode on the eastern side, where stands the Mahébourg of to-day. They began the clearing of the forests and introduced the sugarcane from Batavia. In 1712, however, the Dutch families emigrated to the Cape, where they hoped to find better means of livelihood.

Soon there arrived some French Creoles, and in September 1715 Captain Guillaume Dufresne appeared with his ship the "Chasseur", took official possession of the island and gave it the name of Ile de France. The colony did not begin to flourish till the year 1735, when Mahé de Labourdonnais came to the Mascarenes as governor. It did not escape his practical eye that the spacious harbour on the west side was far more convenient for trade than the roadsteads of the island of Bourbon, lying, as they do, at the mercy of all the winds.

In the first years of his administration he brought about the transference of some 2000 Creole settlers and negroes, and expended public money in favour of the Ile de France, thus slighting Bourbon and bringing down upon himself much hatred and even calumny. The centre of gravity of the sister colonies was soon shifted to the Ile de France, and Réunion had to take second rank.

At the beginning of this century this possession, then

rapidly increasing in prosperity, was lost, passing into the hands of England.

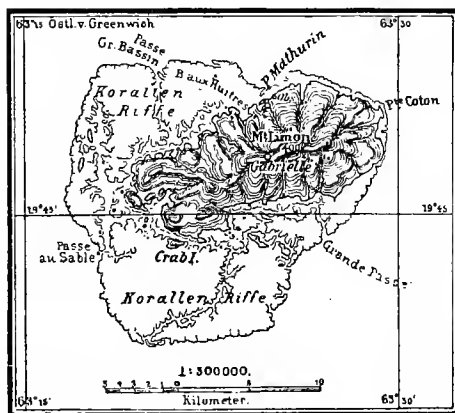
After conquering Réunion a strong British fleet made its way to the Ile de France, the resistance of General Decaen was overcome, the island had to capitulate on the 3rd December, 1810, and has since remained in the possession of the English.

The first Governor of Mauritius—as the island was now again called—was that energetic and far-seeing Sir Robert Farquhar, whom we have already got to know in the history of Madagascar at the time of Radama I.

CHAPTER XVII

RODRIGUEZ

RODRIGUEZ is the smallest of the Mascarene Isles, having a length of only 21 miles and a breadth of 8 miles with 42 square miles of surface. It lies in 19° S. lat. and $63^{\circ} 20'$ E. long. at a distance of 400 miles from Mauritius. The surface is a chaos of irregular masses of lava. At several places these are cleft into mighty basaltic columns, as, for instance, behind Oyster Bay in



Map of Rodriguez.

the north. A broad encircling reef surrounds the island; stretching in the south as far as 5 nautical miles into the sea. Only a few narrow channels permit of access to the island, and it is thus only with difficulty that it is reached by vessels of any size. Of greater elevations

in the interior, Mount Limon, placed at the centre of the island, is only 1300 ft. high.

The island, which was occasionally visited by Portuguese and Dutch, was originally called Diego Raïs; in the year 1726 it was declared a French possession by Dioré, who was then governor of Bourbon, and it was called Marianne Island; this designation, however, was not permanently retained, but was converted into Rodriguez. The first settler who lived for any long time on the deserted island was the French emigrant François Leguat, who left his fatherland after the Revocation of the Edict of Nantes and came to the Mascarenes in a Dutch ship. He lived on Rodriguez from 1691 to 1693 and very valuable information concerning the Natural History of the island was given in his travels which appeared in 1708. The island was then rich in tortoises; the solitaire, too, was still found in great numbers. Leguat's statements were shown to be founded on fact by Newton, who in 1866 went to Rodriguez with a band of coolies from Mauritius and dug up some 2000 bones of this bird.

In the last century, tortoises still formed an important article of export and provided the Colony of Ile de France with fresh meat. In 1760 four ships appointed to the provision trade brought away the enormous number of 30,000 tortoises in the course of 18 months. The island was settled by several Creoles, but principally by black labourers living partly in the valleys of Port Mathurin, partly in the inland town of Gabrielle; it attained continually increasing importance as a provision market for Mauritius, by the cultivation of vegetables and maize, because, owing to the engrossing sugar culture in the latter island, a sufficiency of provisions could not be grown. A notable trade in dried fish is also carried on in Rodriguez. In 1845 the number of inhabitants was not more than 250. By the year 1886 it had risen

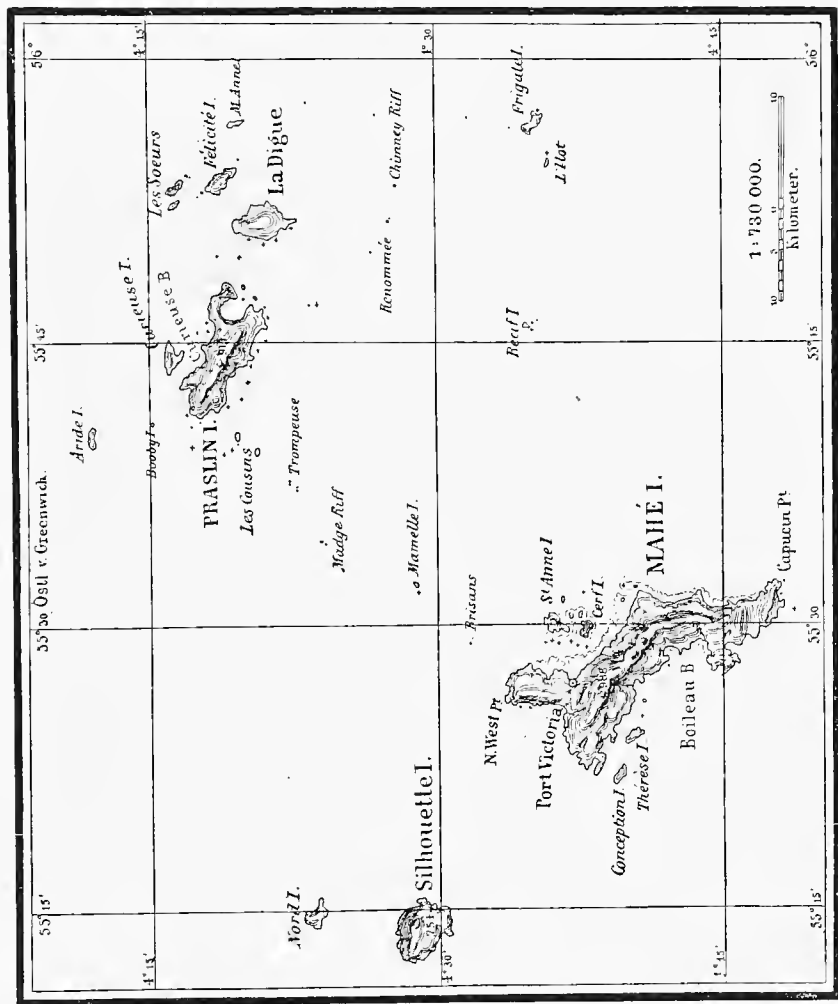
to 1780; the increase seems to have continued, for in 1893 there were 2332 inhabitants.

After Mauritius was conquered by England in 1810, Rodriguez also passed into British possession, but only formed, as to its government, a dependency of the first-named colony. A commissioner named by the Governor attended to the business of administration. The annual budget was placed in 1896 at 39,000 Indian rupees. Trade returns in the same year showed an import of 633,000 rupees as against an export of 764,000 rupees.

CHAPTER XVIII

THE SEYCHELLES

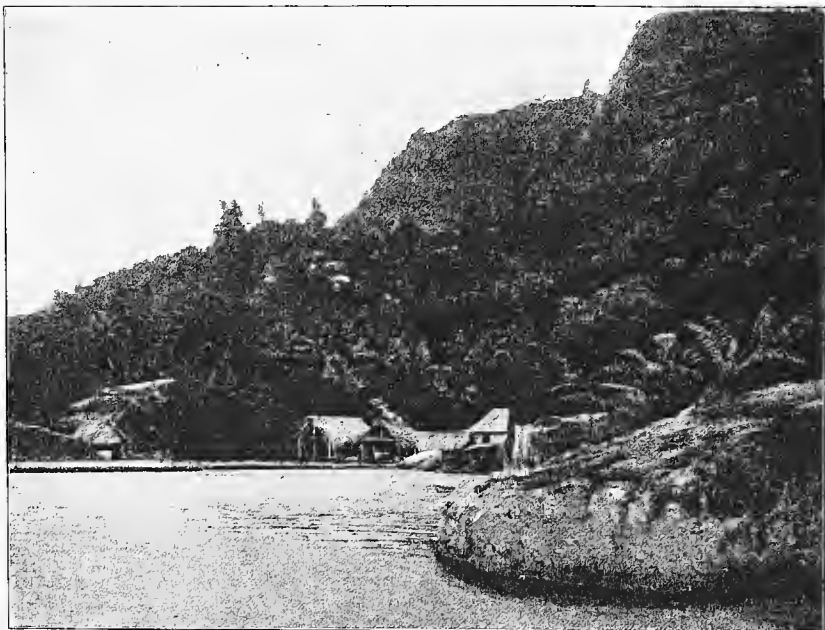
THE Seychelles Islands may be called fragments of the old continent "Lemuria" which was submerged at the formation of the Indian Ocean. They form an archipelago of twenty-nine variously sized islands, whose formation was apparently coëval with the terrestrial mass of Madagascar. These islands were not upheaved by volcanic power, for their nucleus consists of primitive rocks, masses of granite which are either exposed, or, in the case of the lowest lying islands, cased with recent coral formations. Apparently we have to do with small pinnacles of rock which remained above water when the mighty ocean bed was formed. All of them, and this seems to support the above hypothesis, stand on the mighty submarine plinth which extends from the south of Madagascar to the equator, at a depth of only 900 fathoms, and upon which rests also the colossal island of Madagascar. Next to this last lie the uninhabited Farquhar Isles; then follow to the north the small island of Providence, the Amirante coral islands, and then, as far as the 3rd parallel, the Seychelles in the narrower sense. These last take the foremost place, in consideration of their extent, for they have a surface of 103 square miles, while the Amirante Isles only cover an area of 32 square miles. Mahé, the most extensive of all the Seychelles, lying between the 4th and 5th parallels, has a coast-line of 15 miles with a surface of 46 square miles; then comes Praslin which is to the north-east of Mahé and easily visible from it, with 16 square miles



Map of the Seychelles.

of surface. Among the smaller islands in the neighbourhood, some of which are uninhabited, La Digue, Curieuse, Félicité, Les Sœurs, and Silhouette are the most important.

The Portuguese, in their voyages to India, were the first to obtain a knowledge of the Seychelles. It seems



Coast view in the Island of Mahé with Masses of Granite. In the foreground is a Creole Settlement.
(From a photograph by Dr. A. Brauer.)

that under the name of *Amirante Isles* or *Admiral Isles* they understood these larger islands, which received their present name about the middle of the last century from an eminent French officer of the French Indian fleet, *Morando de Seychelles*, while we now apply the name *Amirante* to a group of low unimportant islands lying

to the west of the Seychelles proper. They were not known in any detail until the renowned governor, Mahé de Labourdonnais, sent Capt. Picault to the Seychelles to take possession of them for the French. The principal island received the name of Mahé in his honour. From that time dates the first survey and exploration of the island, and shortly afterwards several Creole families emigrated from the Mascarenes to the Seychelles.

The larger islands rise into considerable mountains, the highest of which is on Mahé and attains an elevation of 3240 ft., while Praslin reaches 3000 ft. and Silhouette 2444 ft. The primitive rock composing them is granite, which has the closest correspondence with that of Madagascar. The valleys are covered with a layer of fertile soil; coral reefs exist almost everywhere in greater or less extent. Mahé is fringed by coral reefs on the east side, though there is proof that the area is one of elevation, as coral formations occur on the coast at 80 ft. above the sea. Praslin has reefs on the north and south-west sides, Curieuse on the north, while Silhouette seems to be entirely fringed with reefs. The Amirante Isles, according to Capt. Moresby, consist of coral and shell detritus, and project only some 60 ft. above the water.

The climate is an excellent one according to A. Brauer, the heat being moderated by the trade wind, so that fevers are almost unknown; this is also indicated in the remarkable fact that the percentage of births among the inhabitants is largely in excess of that of deaths. The oscillations of temperature during the year are strikingly small, ranging only from 79° to 84° F. The average obscuration of the sky is 5·3, that in January is 6·1, in April and May 4·9 and 4·8.

Formerly it passed as an established fact that whirlwinds do not reach the Seychelles; this is not quite accurate, though it is true that cyclones occur but seldom.

The first observed was in 1862 and, according to the accounts of eye-witnesses, it raged in a fearful manner. Col. Pelly says that the roaring and howling of the sea, of which nothing was to be seen but froth and foam, was quite awful. "The aspect of the land after the storm was a sad one: precipices undermined by the rain slid down into the deep, burying gardens, houses and man in their fall; brooks swelled into rivers and their floods swept everything into the sea; trees were rooted up, cocoa-nut palms snapped off, and on the land lay wrecks of vessels that had been dashed to pieces by the elements." Since then little has been heard of any further storms.

The fertility of the soil is very great. The land exhibits a luxuriant covering of vegetation, which the traveller coming from the Red Sea and its dreary coasts hails with pleasing emotions.

The cocoa-nut palm flourishes on the islands in rare beauty, and, whereas elsewhere it is to be seen chiefly on the shore and the belt of coast, it reaches here high up the slopes of the mountains. The flora exhibits some 340 species, of which 60 are indigenous. Areca palms and sago palms, side by side with cinnamon trees, mangoes, and the picturesque bamboos (*Nastus borbonicus*) adorn the gardens and hill sides. One fan palm, which has attained great celebrity, is peculiar to the Seychelles, viz., the apparently almost extinct *Lodoicea Seychellarum*, the fruit of which, the so-called double cocoa nut or Maldivé nut, was known to the Portuguese under the name "Coco do Mar". These were fished up at the Maldives and on the Malabar coast, their origin being unknown; they were said to have grown in the depths of the Indian Ocean, and even so respectable a writer as Rumphius in his *Herbarium amboinense* tries in all seriousness to make this credible. But in the year 1789 the home of this palm was discovered to be



Lodoicea Seychellarum in the Island of Praslin.

(From a Photograph by Dr. A. Brauer.)

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on Praslin. Here the nuts are produced; they are washed into the sea by the rain and then driven by the south-west monsoon to India, where they are fished up.



Vegetation on the Island of Mahé.
(From a photograph by Dr. A. Brauer.)

Sonnerat, that great investigator of nature, transplanted the fan palm in question to the Mascarenes. The brownish black nut takes seven years to ripen; it is about a foot

in length and is deeply bifurcated in the middle. It is still looked upon in India as curative; Indian princes used to hold it in high esteem, as its nut was said to render all poisons innocuous. At one time a single nut cost as much as £100; they can now be purchased in Aden or Bombay for two or three rupees (some three or four shillings). The number of places where these beautiful fan palms are found has so seriously diminished of late that fears have been entertained of their total extinction, and they have had to be placed under the protection of the authorities. This is all the more necessary as the extremely hard wood of the trunk, which appears to be almost indestructible, is useful in house building. At present, according to A. Bauer, this palm only occurs in two small valleys of the island of Praslin and on the north side of Curieuse Island. Accordingly, the English Government, to prevent the total extinction of the palm, have taken these localities into their own possession.

In the mountain region, ferns and mosses are found in the lower belt, higher up are extensive grass plains, where pine-apples grow wild. Pandanus groves and tree ferns appear in still higher regions, the former having aerial roots 20 to 25 ft. long. In this region grows the pitcher plant (*Nepenthes*) which at the points of the leaves has receptacles of the shape of a tobacco-pipe bowl for holding water. The summits of the mountains are covered with woods of the indigenous *Wormia ferruginea*.

The animal world of the Seychelles, as is the case elsewhere in the tropical islands, appears to be decidedly poor. Indigenous mammals seem to be quite wanting; birds, on the other hand, have been better able to reach the islands; a dark-coloured parrot (*Coracopsis Barkleyi*), apparently coming from Madagascar, has become modified into an endemic species. A red-breasted pigeon (*Erythrœnas pulcherrima*), a honey-sucker (*Nectarinea*) and sparrows of a distinct species must be mentioned. Among the

Reptilia are the turtles, which are kept for their flesh in special tanks and are chiefly imported from Aldabra. The hawks-bill turtle, so useful on account of its tortoise-shell, is frequent on the coasts. The Indian gavia is said to be found in the waters. An elegant lizard (*Pachydactylus cepedianus*) is of a brilliant green with bright red spots on the back. Geckoes are numerous and even cœciliæ have been mentioned. The graceful Mascarene frog (*Rana mascareniensis*) is not to be found here among the representatives of the Amphibia, although it is frequent over the whole of the East African Archipelago.

The Insect world is poor. There is a strange locust, remarkable for its mimicry, the leaf insect (*Phyllium siccifolium*), which, however, does not, as the name implies, resemble a dried-up leaf, but one of light green, so that it requires some practice to detect it. Boys of the place catch these wonderful creatures in order to earn pocket-money by offering them to strangers at tolerably high prices.

Domestic animals are scarce; the goat is the only animal besides the dog which is kept in any considerable number; humped cattle or zebus are but seldom met with, so that meat has to be obtained in some other way. The turtle is principally used here to supply meat, and its flesh takes the place of beef. The island of Aldabra is the chief source of supply, and as yet this has always proved a prolific one.

The turtles are imported alive and taken when wanted from the tanks in which they are kept. As, however, many of these animals perish from being cooped up in the ship, people are beginning to send the meat in a dry state, and it is then sold in the Seychelles at 50 centimes per pound.

Husbandry, as regards the cultivation of profitable plants, might be carried on far more skilfully than is actually the case. The inhabitants, enervated by the mild climate, are just a little indolent. The chief plant of cultivation

is the cocoa-nut palm, the produce of which is exported in the shape of copra and forms the most important source of income in the islands. The owner of a hundred palms is considered prosperous enough to live without labour. Latterly the cultivation of vanilla has gained some importance. Bananas, tobacco, coffee, rice, manioc, sugar-canes are not extensively cultivated, but enough is produced for the wants of the inhabitants.

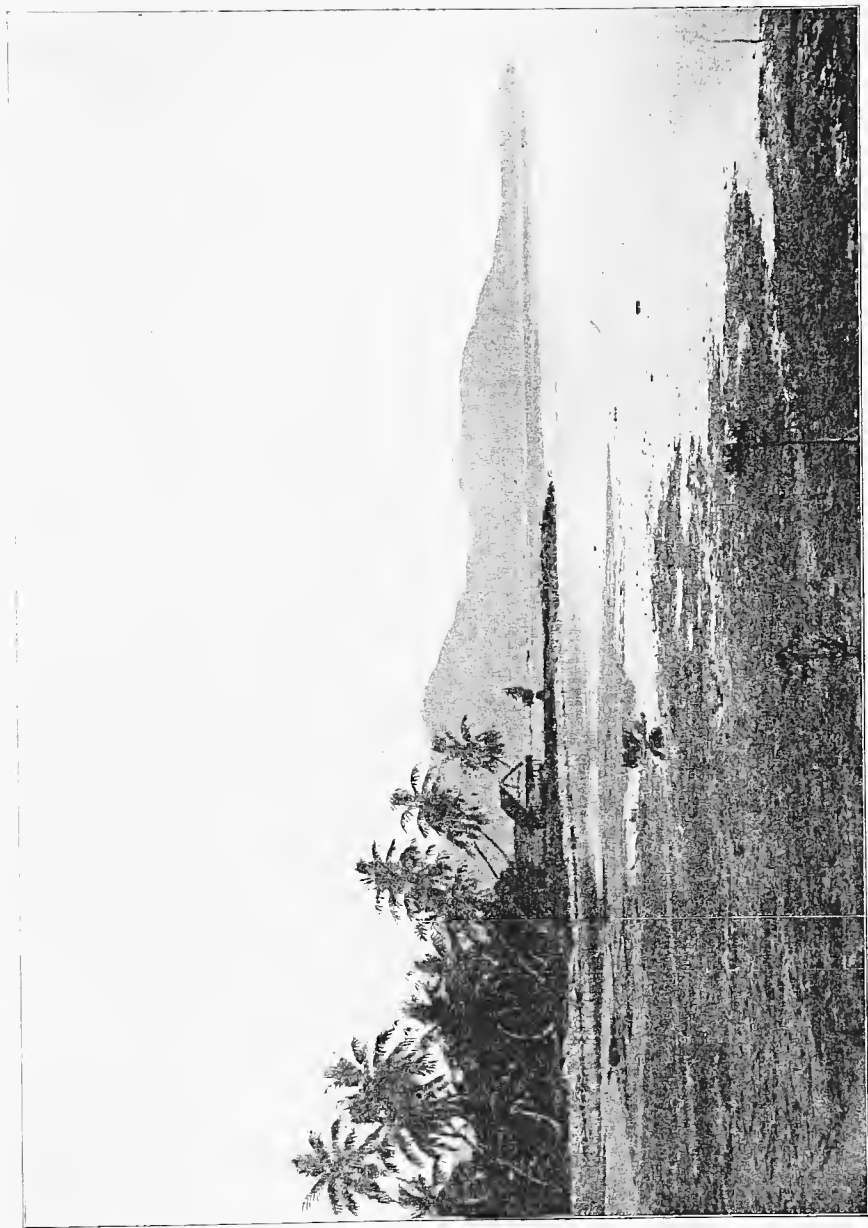
The inhabitants of the Seychelles are Creoles from the Mascarenes, and their customs and language bear the stamp of their origin. The first settlement took place towards the middle of last century, but the colony did not make any great progress till Mahé de Labourdonnais had incorporated it with the French possessions.

The number of the population amounted at the beginning of this century to some 6000 souls, of whom the majority were slaves. By 1861 this had increased to some 7500; though on the chief island, Mahé, it is said to have been only 1327. By the year 1894 the number of inhabitants of the Seychelles had risen to 17,600 souls.

The population is a mixture of European, African, Indian, Malay and Chinese elements, to which must be added numerous Mulattoes of all shades of colour. The central point of the population is the island of Mahé, where ships call at the picturesque harbour of Port Victoria. Creole-French with its peculiar turns of expression has maintained itself as the predominant language.

The inhabitants are considered hospitable and possess the amiable sociality of the Creoles in a high degree. The ladies, as Baron Decken remarks, exhibit a grace of deportment such as one would hardly expect to find in such a remote spot of the earth.

These colonies will only thrive, however, if they have immigrants of more businesslike character, less enervated, and less addicted to pleasure.



View of the Island of Mahé from the North: the Promontory of Port Victoria in the Background.
(From a Photograph by Dr. A. Brauer.)

Industry is very little developed, and there is no trade of importance. If steamers of any size stop there the inhabitants try to get a little profit by selling produce. They supply provisions to such vessels as well as to the whale-ships.

One speciality I have noticed there which I have come across nowhere else, a delicious preserve made of bananas. Besides this, pretty wickerwork and tastefully worked fans are produced. These are made of the leaves of the *Lodoicea seychellarum* and are embroidered with silk from Madagascar. Delicate liqueurs made from bananas are sold to travellers by the Creoles.

Commercial activity has somewhat improved just lately, and whereas exports varied between 300,000 and 400,000 rupees in the seventies, they rose to 764,000 in 1896. Imports in the same year amounted to 633,000 rupees.

The island of Mahé was formerly of importance as a coaling station, and the Australian steamers of the *Messagéries maritimes* used to call there regularly. At first these used to run to Réunion and Mauritius, and later on from Port Victoria direct to Australia, but at present these liners have quite given up calling. In the beginning of this century the Seychelles were lost, and passed to England, which took over the government in 1816. They are dependencies of Mauritius and are governed by an English Civil Commissioner. There is a certain disadvantage in this, as the financial competence is not very great, and lawsuits have to be decided in Mauritius. The inhabitants have therefore long had the wish to possess an independent administration.

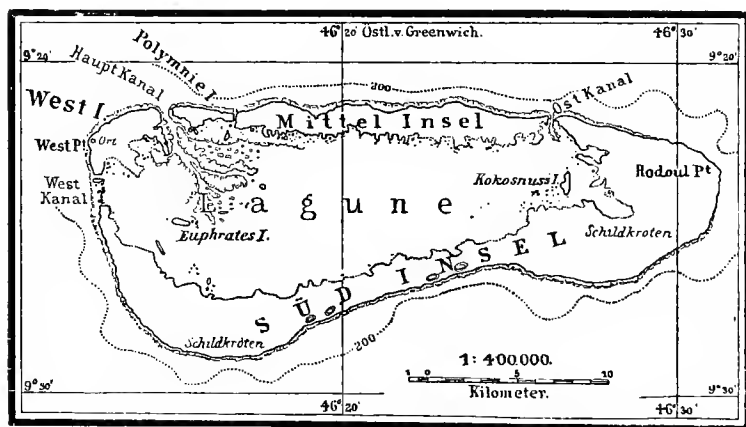
As to England, however, it is doubtful whether the islands would repay the costs of administration. Even at present a subsidy is necessary, as, in 1896 for example, the revenue only amounted to 235,000 rupees, while the expenditure was 278,000 rupees.

CHAPTER XIX

THE ALDABRA ISLES

BETWEEN the Seychelles and the Comoro Isles lies a small group of islands consisting of the Aldabra Isles ($9^{\circ} 22'$ S. lat. and $46^{\circ} 14'$ E. long.) and the neighbouring islands of Assumption, Cosmoledo and Astow.

These islands were doubtless known long ago to the Arab mariners, and were seen by the Portuguese on



Map of the Aldabra Islands.

their voyages. The chief island, Aldabra, was mentioned as early as 1511 under the name Ilhadara, and a little later it was designated as Adarno and then as Albadara. In the year 1742 Aldabra became better known by the voyage of Lacaze Picault and Jean Grossen to the Seychelles, and in 1878 Wharton prepared a map; more

detailed maps were got up later by Dr. Abott, an American, and Dr. A. Völtzkow, a German, the latter of whom sailed from North Madagascar to Aldabra for the purpose of investigating its Natural History.

Aldabra, according to the description of the last-named very trustworthy investigator, is an oval atoll with a major diameter of 19 miles and a maximum breadth of $7\frac{1}{2}$ miles. It has three small entrances, the largest of which, that on the north side, is only half a mile wide. The lagoon is shallow and is partly dry at low tide. The belt of land projects from 3 to 6 ft. above the limit of high tide and is steep towards the sea; its breadth varies from half a mile to 3 miles.

The geological structure everywhere shews us only recent coral. Whether the underlying rocks are volcanic or composed of primitive rock, cannot be determined owing to the fact that these rocks do not come to the surface. Possibly we have to do with a pinnacle approaching the surface with an atoll resting upon it. The island seems to have been originally a flat reef, gradually worn and washed away in the middle during a slow upheaval. Völtzkow remarks that numerous islets of mushroom shape occur in the interior of the atoll. I look upon these as secondary formations, for the mushroom shape, which I also have observed in the erythræa-like reefs, agrees with the one on the part of the coral-polype in its need for light.

There are two good-sized islets in the interior of the lagoon: the long Euphrates Island, which is 3 miles distant from the inner edge of the belt, and Cocoa-Nut Island in the east of the lagoon, which, as its name indicates, is covered with cocoa-nut palms.

There are no brooks or rivers, so that it is necessary for the settlers to collect during the rainy season sufficient water for their needs and to store it in reservoirs. On

the south-eastern side is formed a water-hole which never dries up, containing slightly brackish, impure water; it is only 6 ft. broad and $4\frac{1}{2}$ ft. deep.

Aldabra, lying within reach of the trade winds, has a pleasant climate. The temperature rises in April and May to 82° and 84° F., but cools down at night to 77° and 79° F. The rainy season, according to Dr. Abott, begins in December and lasts till May. The dry season commences at the beginning of July.

We have quite lately obtained important particulars as to the flora and fauna. The details collected by Prof. Hans Schinz furnishes a list of 71 species, of which 60 are peculiar to the island. The sand-dunes are overgrown with casuarinas (*C. equisetifolia*). The creeping *Ipomœa pescapræ* grows exuberantly on the sea-shore; scattered thickets of borage (*Tournefortia argentea*), with fleshy leaves, are among the characteristic forms on the sand-hills. Mangroves only occur on the eastern side, where they are so dense as to make it difficult to land.

A dense bush begins in the neighbourhood of the shores, which gives place here and there to park scenery; the height of this underwood varies, sometimes being as much as from 16 to 20 ft. Among the characteristic forms of this underwood there are *Ficus nautarum*, conspicuous by its close foliage, and *Ficus aldabrensis*; then *Grevia salicifolia*, reminding us of our willows, as well as species of spurge some six feet high (*Euphorbia Abotti*). Among screw-palms only one species has as yet been observed, apparently *Pandanus Vandermeeschii*. The occurrence of *Moringia pterygosperma* is peculiar. It is a cultivated plant in the tropics and has apparently been imported unintentionally. The flora, according to Schinz, is closely connected with that of the Mascarene Isles, but has received in addition numerous types from Madagascar and East Africa.

The animal world allows us to recognize the original

strongly endemic character of an oceanic island with as yet but little adulteration. Human desire for gain has not hitherto succeeded in destroying the originality of this secluded corner. The lower animals seem to be weakly represented, and point to an immigration from Madagascar or Africa. Among the grasshoppers, *Phanacroptera nana* is the most common; among the praying locusts, there are found *Mantis prasina* and *Hicrodula Völzkowiana*. Mosquitoes are a regular plague and make residence in the bush almost impossible. Land crabs (*Birgus sp.*) are represented by two varieties differing in colour.

Of higher animals, the almost entire absence of mammals is noteworthy; there is only a single small bat and possibly also a flying fox (*Pteropus*). Rats and mice have been introduced and do great damage to the maize plantations.

The feathered tribes are uncommonly rich in individuals, but not in species, as only 27 have hitherto been mentioned.

Many oceanic birds find Aldabra a secure resting-place. The feathered creatures seem here for the most part to have entirely laid aside their fear of man, their familiarity is so great that sometimes they let themselves be taken by hand, or they come innocently into the huts. A small turtle dove (*Turtur aldabranus*) may be indicated as the characteristic bird of the island, being met with at every step; *corvus scapulatus* has already come here, but only a few specimens are to be seen. A small goat-sucker (*Caprimulgus aldabrensis*) moves silently through the air in the twilight. The strand is animated with stone curlews, sandpipers, herons and terns. Gannets (*Sula piscatrix*) and frigate-birds have their sleeping-places here, but at daybreak they take their long flights over the sea. Reptiles are represented by two small species of gecko and a small sand lizard (*Ablepharus bouton*); chameleons seem to be entirely wanting, as also

are snakes, but, on the other hand, the island forms a place of refuge for turtles and gigantic tortoises. The former are so numerous that in 1847 a trader asserted that he could supply 12,000 in the year. They are conveyed for the most part to the Seychelles, as has been already mentioned.

Tortoises are still found in great numbers. In 1847



Vegetation on Cocoa-Nut Island, Aldabra Islands.
(From a photograph by Dr. A. Voltzkow.)

the crews of two ships were able to catch 1200 of them in a short time, among them being giants weighing 8 cwt. each. Even now they may be counted in thousands, but are for the most part only visible in sandy places at the time of laying their eggs, whereas for the rest of the time they retire into the bush, living principally on the fruit of the screw-palm. We know of four different

species of giant tortoises belonging to Aldabra, viz., *Testudo elephantina*, *T. gigantea*, *T. hololissa*, and *T. Daudini*. According to the tortoise catchers, there are such mighty specimens living in the bush that it is quite impossible to transport them. As these animals propagate quickly an early extermination is only to be looked for if the bush should at any time be destroyed.

The island is only inhabited at the present time by some twenty persons. These are blacks who have immigrated from the Seychelles and have founded a small settlement of ten houses. They are in the service of a contractor and grow maize, batatas, tobacco and vegetables to some extent, but their chief business is catching turtles and tortoises.

The numerous turtles (*Chelone viridis*) are either caught where they come to shore, or harpooned in the shallower parts of the sea. The rowing boats used for taking them are lightly built, and flat-bottomed so as not to run aground. When the animals are hit they swim away as quickly as possible, dragging the boat after them; at last they get tired and are taken on board. They are either conveyed to the Seychelles alive, or they are killed, their flesh being then cut into strips and dried in the sun.

The fat of the turtle forms a very important article of trade. It is packed in iron vessels holding 11 gallons and exported to France, where it enjoys a certain demand for medicinal purposes. The lung, when dried, is esteemed as an ingredient for soup. Another business is fishing for holothurias, these sluggish sea-cucumbers occurring many together on the reefs as well as in the shallow lagoons.

The cocoa-nut palm has been introduced at several points of the island, and may perhaps yield a good return in the future.

The favourable conditions of existence might well support an increased population, as the people would find

plenty of subsistence in the abundance of fresh turtle meat and turtle eggs. Moreover, the sea appears to be rich in fish.

The only disadvantages are the imperfect communication with the neighbouring colonies, and the great distance from them; the Seychelles, for example, with which there is at present most intercourse, lying at a distance of 550 nautical miles. Steamers are not in the habit of calling at Aldabra, but a schooner comes from the Seychelles two or three times a year. It is most quickly reached by means of the well-built sailing ships from North Madagascar, to which the current from East Madagascar renders assistance. Landing is somewhat difficult, owing to the roughness of the surrounding sea.

Aldabra and the neighbouring low coral islands, Cosmoledo, Assumption and Astow, are in the possession of England, and are under the government of the Seychelles. At present an English factor has taken these islands into profitable management, paying for each of them a monthly rent of five dollars.

CHAPTER XX

AUSTRAL-AFRICAN ISLANDS

THE western part of the Indian Ocean contains yet other isolated islets and island groups which, while approaching the mainland of Australia, may be looked upon as advanced posts of Africa. The character of their flora and fauna differs widely, however, from that of Africa, and in the districts furthest off begin already to take an Antarctic stamp which has also drawn admixture from America, more especially Terra del Fuego. We allude to the widely scattered islands of New Amsterdam, St. Paul, Marion and Prince Edward Island, the Crozet Isles, Kerguelen Island (frequently visited by whalers), and, lastly, Heard Island.

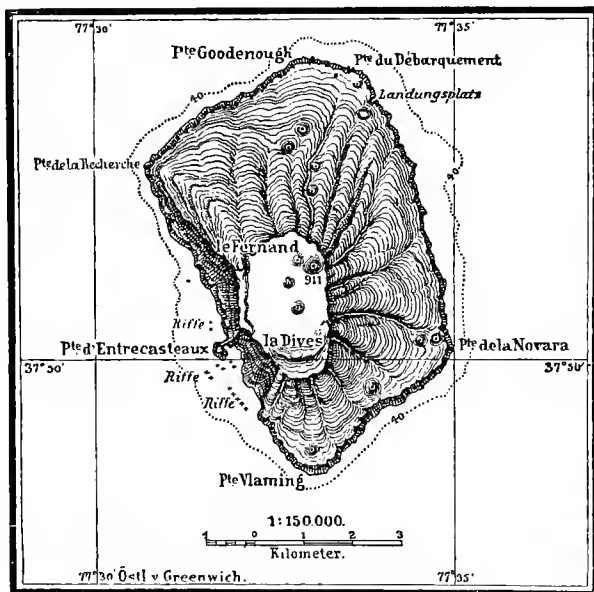
In geologic age these islands shew marked differences; they have never possessed a connexion with the African continent, but have one and all been raised above water as volcanic masses. St. Paul and the Amsterdam Isles take an isolated position by reason of their natural productions, while the islands on the western edge of the Indian Ocean have many striking traits in common as regards their flora. This indeed may come from the fact that they are all affected by the Kerguelen Current.

No permanent settlement of these islands has as yet taken place, as the economical conditions are quite unfavourable.

CHAPTER XXI

NEW AMSTERDAM AND ST. PAUL

THESE two islands, fifty miles apart, rise from a considerable depth in the Ocean, half-way between the Cape of Good Hope and South Australia. The history of



Map of New Amsterdam.

their discovery is not without interest. It seems that the northern island, Amsterdam, was first seen on the 18th of March, 1522, by Sebastian del Cano, but he did not make any attempt to land. He determined its

latitude to be $37^{\circ} 35'$ S. Nearly a century later, in the year 1617, the Dutch ship "Zeewolf" sighted the southern island, St. Paul. They were both noticed in 1633 by the Governor Van Diemen during his voyage to India, and the hitherto nameless north island was distinguished from St. Paul by the name of New Amsterdam. But it was only in 1696 that the Dutch navigator Willem van Vlaming set foot on this island. It is a matter of considerable interest that he mentioned that the crater lake of St. Paul was then completely shut off from the sea, and that the dam, now broken through, then rose in its whole extent above the surface of the sea, affording a resting-ground for the numerous eared-seals.

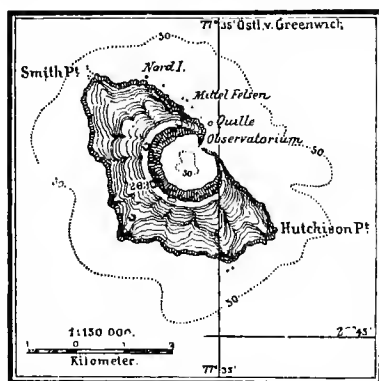
The Novara expedition touched at St. Paul and Amsterdam in 1857, and the Austrian geologist, Hochstetter, made valuable geological observations. Seal hunters and fishermen have often come into this region of the sea to plunder the extraordinary wealth of its waters. More accurate knowledge about the islands has been obtained through the scientific expedition sent to St. Paul by France in 1874 to observe the Transit of Venus.

The right of possession was formerly not quite clear. It was understood that they were within the area of the Government of Mauritius, while the Creole literature of Réunion indicated that it was a dependency of that colony. In the year 1893 France took official possession of the two islands and hoisted the French flag.

Amsterdam Island, with a superficial area of 26 square miles, lies in $37^{\circ} 50'$ S. lat. and $77^{\circ} 35'$ E. long. It is of quadrangular shape, is formed of lava and generally seems veiled in mist. It rises to the height of 2952 feet. The highest elevation forms an extensive table-land with several volcanic cones, it approaches very near to the western side and the descent is so steep that precipices occur of 2500 ft. in height, and it

is impossible to obtain a landing. Ships generally anchor on the north side, which is flatter. The coast-line is nowhere strongly broken by bays, which indicates that the island arose at a comparatively recent geological date. At present, however, no traces of active volcanic action are to be found.

The mild and pleasant climate, combined with the fertility of the soil, would render possible a permanent settlement by man. In 1873 a Creole family from Réunion made a first attempt in this direction and introduced a series of plants of cultivation, but after a single year,



Map of St. Paul.

being troubled by nostalgia, they returned to their former home.

The vegetation only exhibits 16 flowering plants, among which are four endemic species. The underwood is composed of *Phyllica arborea*, a plant derived from Tristan d'Acunha. From the same locality comes *Spartina arundinacea*.

The animal world of the island consists chiefly of sea birds which find breeding-places in the lava caves. The strand region is rich in sea fish and large spiny lobsters (*Palinurus*).

The Island of St. Paul, lying about one degree of latitude farther south, is far smaller than Amsterdam island, for its surface is only $2\frac{1}{2}$ square miles. Its volcanic nature strikes the eye at once, for it forms in reality an eruptive cone, into the opening of whose crater the sea has forced its way. This crater is a complete circular enclosure and lies on the north-eastern side, forming a natural harbour, which is not indeed accessible for ships of any size. This is due to the fact that the outer rim of the crater forms a barrier which at only one narrow place is submerged to the depth of a fathom and a half, thus enabling only a small vessel to enter. The crater harbour is filled with water to the depth of 25 fathoms and has a diameter of 1200 yards; the steep walls surrounding the crater are on an average 800 feet high.

The barrier had not been broken through by the middle of last century, for in 1754 it still rose 23 feet above the surface of the sea. The breach did not take place till towards 1780. The destruction of the island is constantly proceeding; in time only a flat horse-shoe will remain, as the breakers work upon the volcanic rock with extraordinary rapidity.

The shore line is greatly worn away by the waves. Near the entrance to the harbour isolated blocks of basalt project above the surface of the sea. There is no good anchorage on the western side.

The emergence of the volcanic island of St. Paul, which is somewhat older than New Amsterdam, took place probably in pliocene times. The crater was apparently active for a long time, then the eruptions decreased in violence, but they seem to have occurred in certain places as late as the end of the last century. At present the volcano is quite extinct, though there are warm places where in 1874 Vélain, one of the members of the French expedition, observed the thermometer rise to 140° and

160° F. when placed in the ground. The hot springs that occur have a temperature of 176° F. and more, according to his observations; the waters are strongly alkaline and chalybeate.

Under such circumstances we must agree that the introduction of plants and animals can only have taken place in recent times. In warm places, mosses (*Sphagnum lacteolum*) and club-mosses (*Lycopodium cernuum*) flourish abundantly. Among ferns *Lomaria alpina* grows at a good elevation. Flowering plants appear to be represented by only a dozen species, among which *Scirpus nodosus* and *Poa Novaræ* form good-sized beds.

The animal world exhibits no single indigenous species, all the animals in the island having been unintentionally introduced. The rats are uncommonly troublesome, the wild-cats prey upon the sea-birds, the wild goats are very shy; there used formerly to be wild swine. Among oceanic birds, albatrosses and petrels appear regularly, but the commonest bird is the penguin (*Eudyptes chrysolaus*). Among lower animals the house-fly and flesh-flies are troublesome; the centipedes, *Julus corallinus* and *Scolopendra borbonica*, have apparently been brought from the Mascarenes. The sea around seems to be extraordinarily rich in fish, and occasionally a mighty cuttle-fish (*Mouchezis Sancti Pauli*), 23 ft. long, is thrown up on the shore. Among the larger useful fishes, *Cheilodactylus fasciatus* and *Latris hecateia* are specially common. Every year in November small vessels from Mauritius and Réunion put in, and carry on productive fishing till February, anchoring in the crater harbour. The fishermen lay up great stores of salt fish, for which the buildings inhabited by the French expedition in the year 1874 are used as store sheds.

It has often been proposed to make St. Paul into a coaling station, so that the Australian steamers might call there, or ships of war might find a safe harbour. With

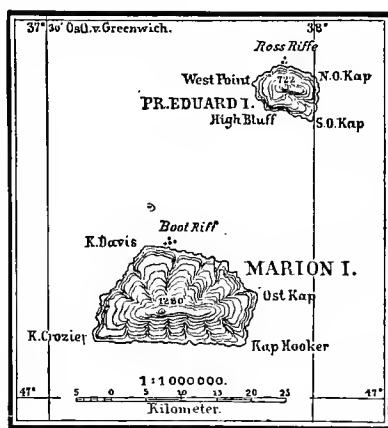
the help of dynamite it would really not be difficult to blow up the bar of the harbour and make the entrance deeper.

Many considerations, however, were loud against the plan. Setting aside the fact that ships avoid this region of the sea on account of the violent cyclones, the harbour is by no means safe. Violent gusts of wind from the south-west break on the high walls of the crater and produce whirlwinds which often tear the ships from their anchorage. Hitherto it has been thought sufficient to make stores of provisions and clothes, so that shipwrecked people may find what is most necessary for their wants.

CHAPTER XXII

THE PRINCE EDWARD ISLES

MARION Island and its smaller companion, Prince Edward Island, form the group which is generally united under the above name. The former lies in $46^{\circ} 51'$ S. lat. and $37^{\circ} 45'$ E. long. The latter in $46^{\circ} 36'$ S. lat. and $37^{\circ} 7'$ long. The distance from the African continent is 960 nautical miles. This group of islands, 161 square miles



Map of the Prince Edward Isles.

in area and at present uninhabited, was discovered in 1772 by the French navigator Marion du Fresne, who took possession of it for France. It was visited and explored during the voyage of the "Challenger." It lies, as do the islands next to be named, within the influence of the cold Antarctic current. Its origin is volcanic.

The larger, Marion Island, has a length of 11 miles with a maximum breadth of 8 miles. The coasts rise by a moderate ascent to the highest point, which lies in the centre and has a height of 4080 ft., approximately. The valleys are narrow and are often filled with lava masses of quite recent date. The heights are covered with snow till December, the beginning of the warmer season.

The flora is scanty. In the higher levels there are extensive beds of moss, and in the lower positions the basalt rocks are covered with Crassulaceæ (*Tillæa moschata*). *Acæna ascendens*, described by Mosely as occurring in beds, *Azorella selago*, and a species of grass (*Poa Cookii*). Here and there, but not in actual plenty, appears Pringlea, which belongs to Kerguelen Land. Between 1800 and 2100 ft. up, vegetation seems to come to an end.

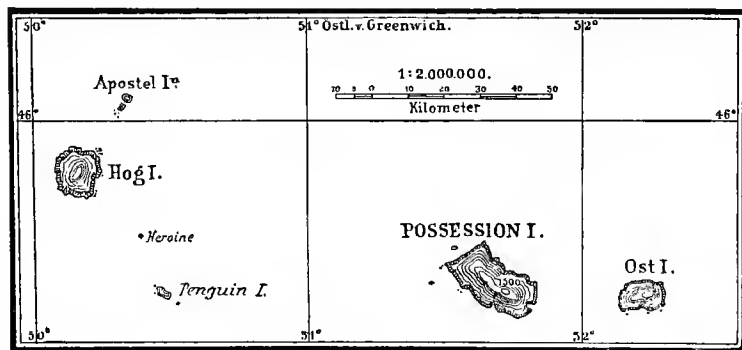
The animal world is almost exclusively represented by birds, the oceanic species, such as terns, petrels and albatrosses (*Diomedea exulans*), breeding among the rocks. Besides these, the penguins of the Antarctic region appear already to hold possession of the flat places of the island, among them being the imposing king-penguin (*Aptenodytes longirostris*) half the height of a man. Of the lower orders of animals a weevil, two kinds of short-wings and a species of fly with stunted wings (*Amalopteryx maritima*) were met with by the Challenger Expedition.

The natural characteristics of the smaller or Prince Edward Island, which received its name at the hand of Captain Cook, are very similar, but it is flatter and less easily accessible than Marion Island.

CHAPTER XXIII

THE CROZET ISLES

A SMALL group of islands lying 50 nautical miles to the east of Prince Edward Island and covering an area of 207 square miles are designated by the name of the Crozet Isles. The most important of these volcanic islands, which are wholly uninhabited, are called Possession, East Island, and Hog Island. They were discovered on the 28th of January by the Frenchman Marion du



Map of the Crozet Isles.

Fresne. He and Crozet took possession of them in the name of France, without attaching any special value to this new acquisition. The islands have been repeatedly visited since their discovery, as by Charles Goodridge, for instance, in the twenties, and then by the "Challenger."

The natural character of the islands is similar to that of the former group, but the coasts are for the most

part steep. The temperature is rather low during the warm months; the "Challenger" noticed a mean of 43° to 45° F. in December, the thermometer rising to 50° F. on only two occasions.

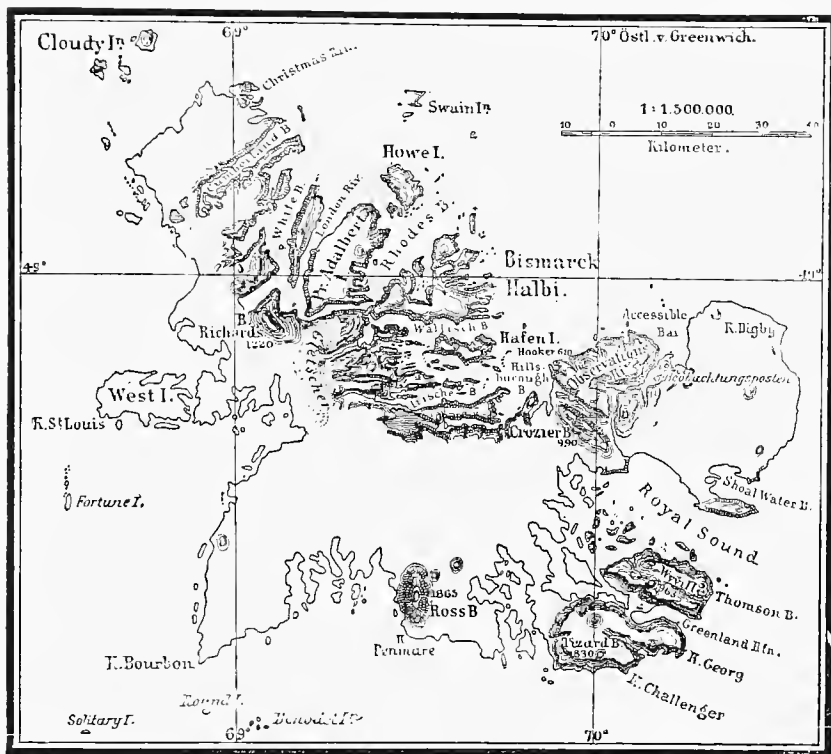
The vegetation seems to be similar to that of the Marion Isles, but does not rise so high on the mountains. Goodridge observed trunks of trees beyond the shore line, but this was obviously only driftwood. At the beginning of this century the island was inhabited by wild hogs, which harassed the young birds, at present they seem to have been extirpated; but, on the other hand, numbers of rabbits make their holes among the lava.

CHAPTER XXIV

THE KERGUELEN ISLES

KERGUELEN LAND embraces the island of the same name, together with numerous smaller islands, for the most part much weather-beaten, which are grouped around it, having all together an area of 1334 square miles. The geographical position is $48^{\circ} 50'$ to 50° S. lat. and 68° to $70^{\circ} 50'$ E. long. The group was discovered by the French sea-captain, Kerguelen, after whom it is named. On his hardy voyage in 1772 with his two vessels, "Fortune" and "Gros Ventre", he reached the smaller islands on the north-west, but was unable to land on account of the storms; he even believed that the last-named ship was lost, and the other ship being damaged returned to Mauritius and later on to France. The following year, however, he appeared with a new expedition at the Kerguelen Isles, of which his companion, Boishennec, whom he had believed lost, had taken possession in the name of the King of France. Not many years later, in December 1776, Christmas Harbour in the north of the large island was visited by the famous navigator, Captain Cook, with his two ships "Resolution" and "Discovery". In 1799 Robert Rhodes sailed to the island and made a rough map of the several harbours. He was quite astonished at the abundance of whales, and by his advice numerous whalers betook themselves to Kerguelen and plundered that portion of the sea so completely that Captain Ross, who spent May and June of 1840 at the Kerguelen Isles, found that these animals were already scared away.

Latterly, different scientific expeditions have sought out the islands and have gained more accurate knowledge of their nature. The "Challenger" touched at the Kerguelen Isles in 1873; in 1874—5 three expeditions appeared for the observation of the Transit of Venus.



Map of the Kerguelen Isles.

among which we may particularize especially the German "Gazelle Expedition" under Commandant von Schleinitz. Its publications have materially enriched our knowledge of Kerguelen Isles. Stores of provisions were deposited at the same time.

Later on, the French Government sent the steamer

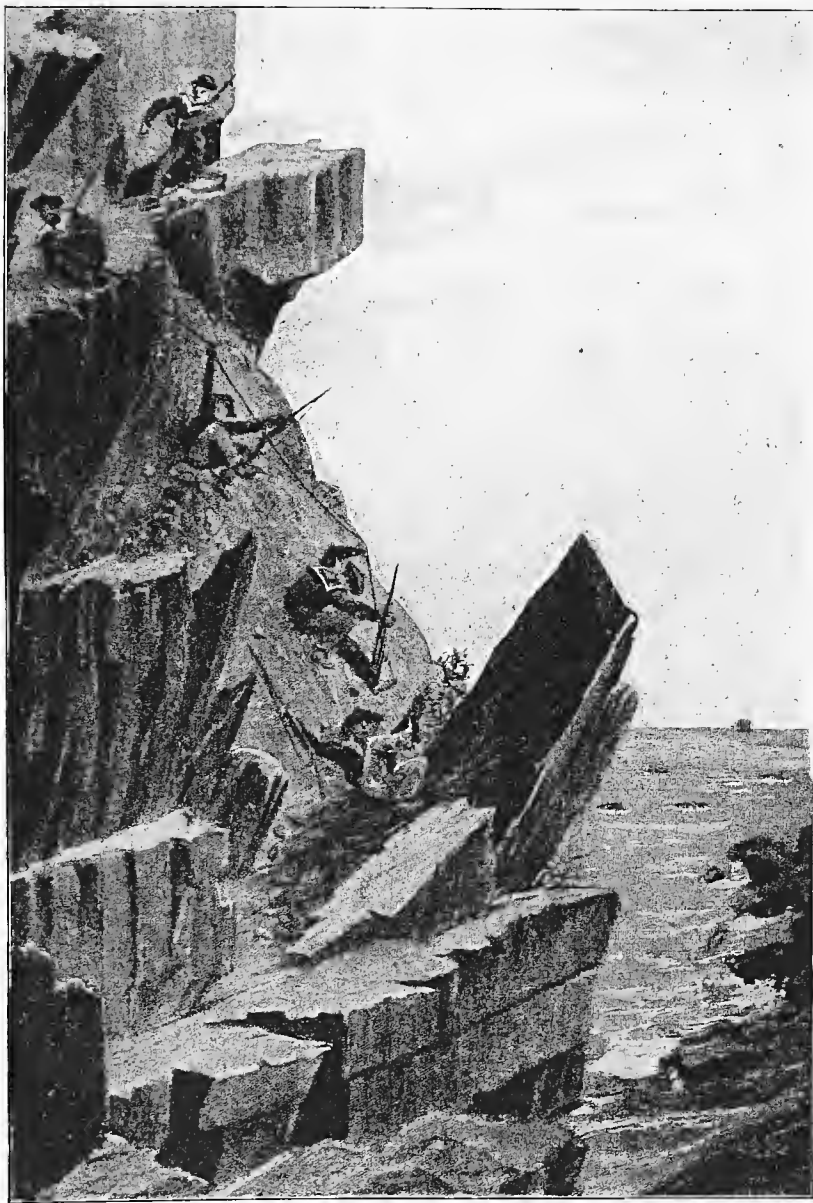
"Eure" to the Kerguelen Isles. It appeared in those waters on the 3rd of January, 1893, hoisted the tricolour and took official possession of the group.

The development of the coast-line is articulated out of all proportion, and fiords with precipitous terraces of cliff cut deep into the land, especially on the eastern side. The southern coast is also very jagged. Of the numerous harbours and bays we must name Christmas Harbour, lying at the extreme north. Near this is the Pointe de l'Arche, the name of which indicates that it is a remarkable natural phenomenon: a mass of basalt 130 feet high rises sheer out of the water and is pierced in the manner of a mighty triumphal arch. There follow then Cumberland Bay, White Bay, Rhodes Bay, and Hillsborough Bay, and in the south the wide Royal Sound. The headlands which project furthest to the south are Cape Challenger and Cape Bourbon.

The interior of the country is as yet quite unexplored, but we know that considerable mountains rise in the neighbourhood of the coast. The highest of these, Mount Ross, lies in the south and reaches the height of 6120 ft. Mount Richard in the north has a height of 4000 ft., and the great peninsula in the east contains Mount Crozier (3250 ft.) and Mount Hooker (2000 ft.).

As the mountain-tops are covered for the whole year with glaciers or snow, descending to 1000 ft., the watering of the country is very abundant. The low land, from which rise bare rugged crags of dark basalt, is marshy, the country is traversed everywhere by flowing streams. Where the ground is level, pools and even extensive lakes collect; through the valleys flow rivers which are constantly nourished by the snows above.

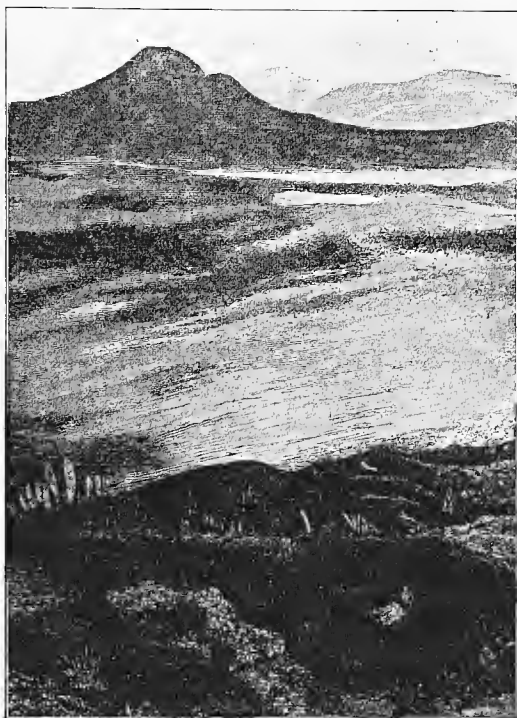
The geologic structure of the country exhibits volcanic rocks both of early and of recent origin. Basaltic columns rise in terraces from the coast. These are



Kerguelen Island : Cliff with Basalt Columns.
(From the Tour du Monde.)

To face p. 230.

difficult of access, and afford breeding-places to the birds of the Antarctic regions. In the interior we find the valleys bounded by steep walls of basalt and dome-like summits, exhibiting in their bareness the appearance of a piece of geologic sculpture. Studer observed ex-



Kerguelen Island: View from Royal Sound.

tensive beds of trachyte which had been pierced by streams of basalt and overlaid by basaltic masses. The place of contact was marked by the occurrence of beautiful crystals of amethyst, white chabasite and zeolite. The beds of basalt, split into columns and disintegrated by the weather, form regular fields of ruins. The

occurrence of coal and of petrified wood must be mentioned as geologic peculiarities. Layers of coal, though not of any great thickness, are so frequently met with that in 1877 the English made an attempt to work them, but gave it up again. In Cumberland Bay there is said to be a bed of coal six feet thick and extending for a mile and a quarter with a breadth of 40 feet. The origin and age of this bed are not yet completely established.

The climatic conditions have been tolerably well ascertained by various scientific expeditions. The influence of the Antarctic current makes itself strongly felt, it makes the mean annual temperature lower than would be expected from the geographical position of the islands.

The warm season begins in December and often brings with it a few days of fine weather, yet the temperature in the Antarctic summer keeps between 45° and 50° F.; while in the winter months (May to August) it is in the neighbourhood of the freezing-point. It appears from the log-book of Capt. Ross that in July, from 6 o'clock in the evening till towards daybreak, the thermometer is constantly below the freezing-point.

It is well-known that these regions of the sea are rendered difficult for navigation by the violent storms from the west, In certain months the strength of the wind is so great that ships are exposed to the danger of shipwreck. Some of these storms of wind move with a velocity of more than 23 miles an hour. The most favourable months are November and December, which are for the most part free from tempests.

Snowstorms occur in every month in Kerguelen Land and make it unpleasant to reside there. The falls of rain are not very copious, though mists and clouds are almost continually present on the heights.

It follows that under such conditions Kerguelen Land is of necessity poor in productions. "The land," says

Studer, one of the members of the Gazelle Expedition, "is not one of those on which rich nature has poured out her horn of plenty and in which the eye of the traveller is enchained by the luxuriance of natural beauty. It lies, then, a rigid desert hardly clothed with its scanty vegetation and washed by the waves of a boundless ocean. The rugged crags with which it rises out of the sea have an inhospitable look even from afar."

The vegetation and the peculiar growths which characterize the flora have become more accurately known of late, through the Gazelle Expedition and the English expedition of the seventies. The plant world here has an Antarctic stamp. Side by side with endemic species, evidently related to the South American flora, occur others which are natives of Terra del Fuego. Of phanerogams there are at present known 21 species, distributed among 18 genera; their flowering season begins in October.

On the whole the soil is bare; it is only where the valleys are sheltered from the west winds that beds of vegetation are formed, but these never rise to any height. Trees are entirely wanting.

The most singular plant, one mentioned in nearly all works of travel, is the Kerguelen cabbage (*Pringlea anti-scorbutica*), a Crucifer, which occurs also in Prince Edward Island, the Crozet Isles and Heard Island. The dense turf-like cushions of *Azorella selago* recall our Alpine *Silene acaulis*, but the bright flowers are wanting. One is glad to make use of them in travelling, in order to get over the marshy ground with dry feet.

A species of grass (*Festuca Cookii*), one of the Compositæ with yellow flowers (*Cotula plumosa*) and *Callitriche verna* form extensive patches of vegetation. On the heights a species of pink (*Colobanthus kerguelensis*) grows on stony soil; and among grasses *Agrostis antarctica* lives as high up as 1000 ft. In the upper valleys,

which vividly recall our lonesome Alpine valleys, the ground is decked with dense patches of moss.

The animal world of the land is exceedingly poor; though the forests of gigantic fucus (*Macrocystis gigantea*),



Pringlea Antiscorbutica.
(From the Voyage of the Challenger.)

and numerous other algæ in the surrounding sea, swarm with crabs, worms, shell-fish and polypes.

Among marine mammals, seals are frequently seen on the coasts, especially elephant-seals and sea-leopards (*Stenorhynchus leptonyx* [the small-nailed seal]). Formerly whales

(*Eubalæna australis*) were seen in great numbers; everywhere along the coast are to be found the bleached skulls and other osteological remains of these animals, left by the whale-fishers after stripping off the blubber. For a long time past, however, this region has been impoverished, as the whales, pursued with over-eagerness, have become more wary and avoid this portion of the ocean. The only mammal dwelling in the interior of the land is the rabbit, which was probably introduced accidentally by recent expeditions, and has since greatly multiplied. The sailors of the "Eure" found the ground at Gazelle Bay honeycombed with their holes, and in a short time killed more than a thousand rabbits.

Among oceanic birds, the king-penguins generally appear in November to visit their breeding-places, but leave Kerguelen Land in March. Besides *Aptenodytes longirostris* another smaller species (*A. taniatus*) occurs. The frequency with which these animals have been captured has seriously diminished their numbers. The list of birds in the island also includes petrels, sheath-bills (*Chionis minor*), terns, dominican gulls (*Larus dominicanus*) albatrosses, cormorants (*Phalacrocorax verrucosus*), and the singular Kerguelen duck (*Querquedula Eatoni*), which occurs elsewhere only on the Crozet Isles and South Georgia.

The Insecta shew a remarkable adaptation to local conditions in their almost entire inability to fly, which prevents their being carried away by the wind. Thus a flightless gnat (*Halvritus amphibius*) lives on the coast, and a brown fly which frequents the plants in great numbers, and bears the scientific name of *Calycopteryx Moseleyi*, has very stunted wings.

That these islands, endowed with natural resources of so miserable a character, should never have been permanently settled by man, is easily explicable in spite of their great extent. Even the first discoverer wrote of Kerguelen, in his diary, that he would rather live in Ice-

land than in this place. When Cook came to this country at a later period it made so dreary an impression on him that he proposed to give it the name of "Island of Desolation". Its possession by the French can entail but little economic advantage. The penguins will soon be exterminated, as they are being killed off for their skins, which are sold in Capetown, and the beds of coal are apparently not worth working. Seal-hunters and whale-fishers might get a little profit from the sea, and at the present time a French contractor has obtained a monopoly of this fishery for 50 years. It has been proposed to introduce sheep-farming, or to transfer the convicts from New Caledonia to the Kerguelen Isles. These are schemes, however, that are not likely to be realized.

If ever it should happen that advantage is taken of the resources of the South Polar regions, the numerous harbours of Kerguelen Land may render it a point of support, and an intermediate station for vessels to call at in order to take in provisions.

CHAPTER XXV

HEARD ISLAND

SOME 240 nautical miles south of the Kerguelen Isles, in lat. $53^{\circ} 10'$ S. and long. $73^{\circ} 30'$ E., lies Heard Island, which is closely related in its physical character to the islands we have described. Its length amounts to 39 miles with a maximum breadth of $9\frac{1}{2}$ miles. At the eastern end it juts out into a tongue-shaped cape; on the north Whisky Bay forms a safe harbour, which is visited by whale-hunters. The ground, which is volcanic, rises in the interior to a remarkable height; the loftiest summit, Big Bon, is said to be over 6500 ft. high.

In the character of its landscapes it reminds one of Greenland, as the glaciers are very extensive, and reach, with their covering of snow, to the very coast. There they are washed by the waves, and great masses are broken off and floated away by the action of the tides.

Numerous cones of ice are distributed over the surface of the glacier; these are covered with volcanic, tolerably coherent sand. Glacier tables, too, are often met with. Glacier streams which change their course every minute furrow the sandy shore.

The climate, according to the reports of the whale hunters, is far more unpleasant than even that of the Kerguelen Isles.

In the Antarctic winter the ground is everywhere frozen, and the brooks and rivers become completely congealed.

Sunshine with a cloudless sky prevails in December, when the high mountain of the island is generally visible;

then too appears the scanty vegetation, which ceases, however, at a height of from 300 to 450 ft.

The flora is extremely miserable, embracing only 5 species of flowering plants, according to the "Challenger" observations, and all these are also native to Kerguelen. Isolated patches of azorella sometimes attain to a considerable extent, detached pieces of ground are covered with a thin covering of grass (*Poa Cookii*), and even the Kerguelen cabbage (*Pringlea antiscorbutica*) though it grows in tolerable quantity, remains dwarfed.

By the pools flourishes *Callitriche verna* in company with saxifrages, and Kerguelen pinks (*Colobanthus kerguelensis*) in some profusion.

The animal world consists of oceanic species of mammals and birds. Sea-leopards and elephant-seals appear to be present here in greater numbers than in the Kerguelen Isles, and the remains of their bones lie about on the sea-shore everywhere. Of sea-birds, the Cape pigeons (*Daption capensis*) occur in astonishing numbers; penguins too are found, and flocks of gulls (*Larus dominicanus*) sit on the neighbouring glaciers.

The insecta appear to be confined to the flightless Kerguelen fly.

In the neighbourhood of Heard Island is situated Macdonald Island, whose rocky cliffs are inaccessible and which has consequently never been explored.

It cannot surprise us that no nation has as yet laid claim to these valueless islands, and they are not likely to be annexed in the future. Seal-hunters and whale-fishers alone have prospect of return for their arduous work. A small number of mariners of American or Portuguese origin visit the islands during the season of fair weather to hunt the marine mammals.

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